Department of the Interior
United States Geological Survey

Prepared in cooperation with the
Mississippi Department of Natural Resources
Bureau of Land and Water Resources

WATER—RESOURCES INVESTIGATIONS
OPEN-FILE REPORT 79-1585

POTENTIOMETRIC M. OF THE RIPLEY AQUIFER
IN NORTHEASTERN MISSISSIPPI,
OCTOBER AND NOVEMBER 1978

This potentiometric map of the Ripley aquifer is the fifth in a series of maps, prepared by the U.S. Geological Survey in cooperation with the Mississippi Department of Natural Resources, Bureau of Land and Water Resources, delineating the potentiometric surfaces of the major aquifers in Mississippi. The map is based on water-level measurements made in 40 wells during October and November 1978 and on water-surface altitudes determined at several points on streams that receive discharge from the aquifer in or near the outcrop area. The altitudes of the water surfaces in the streams were determined from topographic maps and were not field checked.

The Ripley Formation of Upper Cretaceous age in Mississippi comprises several members and much undifferentiated material (Boswell, 1979). The formation crops out in a north-south trending belt (see outcrop on map) and dips about 30 feet per mile to the west. Thickness of the formation is as much as 400 feet, but the cumulative thickness of sand beds commonly is less than 150 feet and may be much less.

The principal water-bearing zone of sand is commonly near the top of the formation and may be as much of 100 feet thick. In Calhoun and southwestern Pontotoc Counties, a lower sand zone forms the principal aquifer.

In and near the outcrop area, there are many shallow domestic wells in the Ripley. The deepest and most productive well in the Ripley is at Byhalia in Marshall County; it is 1,620 feet deep and produces 450 gallons per minute. There are several flowing wells in the lowlands of the streams in the western part of the area--mostly in Union, Marshall, and Benton Counties.

In the outcrop area of the Ripley, the potentiometric surface is strongly affected by recharge from precipitation, by topography, and by drainage of the aquifer by streams. The potentiometric surface slopes generally to the west away from the area of outcrop and is mildly affected by pumpage from wells and by discharge of flowing wells in the valleys of the Tallahatchie and Tippah Rivers (see potentiometric map).

Historically, water levels in or near the outcrop of the Ripley have shown little or no long-term changes. (See hydrographs of wells B8 in Tippah County and K37 in Chickasaw County.) Water-level measurements in several wells in the downdip part of the aquifer indicate that declines of a little more than 1 foot per year are common.

Additional information on the geohydrology of the Ripley aquifer may be found in the following reports:

SELECTED REFERENCES

Belt, W. E., and others, 1945, Geologic map of Mississippi: Mississippi Geological Society, Jackson, Mississippi.

Boswell, E. H., 1963, Cretaceous aquifers of northeastern Mississippi: Mississippi Board of Water Commissioners Bulletin 63-10, 202 p.

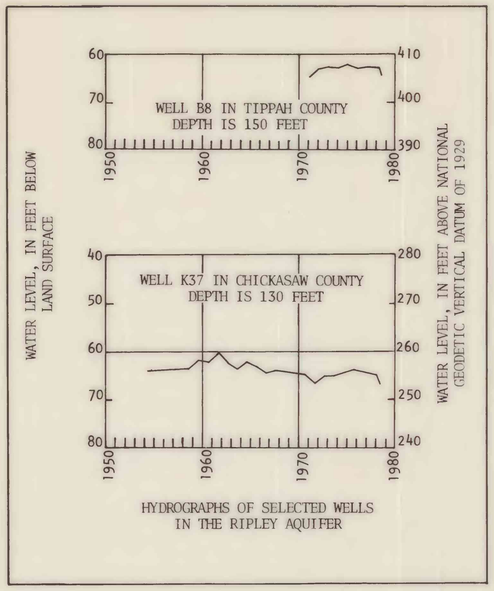
——1979, The Coffee Sand and Ripley aquifers in Mississippi: U.S. Geological Survey Water-Resources Investigations 78-114, map.

Newcome, Roy, Jr., 1974, Water for industrial development in Benton, Lafayette, Marshall, Pontotoc, Tippah, and Union Counties, Mississippi: Mississippi Research and Development Center Bulletin, 73 p.

Newcome, Roy, Jr., and Bettandorff, J. M., 1973, Water for industrial development in Calhoun Chickasaw, Choctaw, Grenada, Montgomery, Webster, and Yalobusha Counties, Mississippi: Mississippi Research and Development Center Bulletin, 61 p.

POTENTIOMETRIC MAP OF THE RIPLEY AQUIFER IN NORTHEASTERN MISSISSIPPI, OCTOBER AND NOVEMBER 1978

B. E. WASSON
1980



HYDROGRAPHS OF SELECTED WELLS IN THE RIPLEY AQUIFER

LOCATION OF THE STUDY AREA IN MISSISSIPPI

Base map modified from U.S. Geological Survey map of Mississippi, 1972

Geology modified from Belt and others (1945)

EXPLANATION

AREA OF OUTCROP OF RIPLEY FORMATION (Ripley aquifer).

—340— POTENTIOMETRIC CONTOUR--Shows altitude at which water level would have stood in tightly cased wells. Dashed where approximately located. Contour interval is 20 feet. Datum is National Geodetic Vertical Datum of 1929. Based on measurements of water-level altitudes in wells and water-surface altitudes of streams in and near outcrop area.

○ F9 OBSERVATION WELL AND NUMBER--Wells are numbered alpha-numerically by county.

●B8 OBSERVATION WELL FOR WHICH HYDROGRAPH IS SHOWN.

△ POINT AT WHICH ALTITUDE OF WATER SURFACE IN STREAM WAS USED TO DEFINE THE POTENTIOMETRIC SURFACE OF AQUIFER.