U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

Prepared in cooperation with the
LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
OFFICE OF PUBLIC WORKS, HURRICANE FLOOD PROTECTION, AND INTERMODAL TRANSPORTATION
WATER RESOURCES PROGRAMS

SCIENTIFIC INVESTIGATIONS MAP 2984
Amite Aquifer and "2,800-Foot" Sand—SHEET 1 OF 1
Fendick, R.B., Jr., 2007, Louisiana Ground-Water Map No. 22: Generalized Potentiometric Surface of the Amite Aquifer and the "2,800-Foot" Sand of the Baton Rouge Area in Southeastern Louisiana, June–August 2006

Introduction

The Amite aquifer and the "2,800-foot" sand of the Baton Rouge area (hereafter referred to as the "2,800-foot" sand) are principal sources of fresh ground water in southeastern Louisiana. Both the Amite aquifer and the "2,800-foot" sand are part of the Jasper equivalent aquifer system. The Amite aquifer is heavily pumped in the Bogalusa area, and the "2,800-foot" sand is one of the most heavily pumped aquifers in East Baton Rouge Parish (fig. 1). The Baton Rouge fault zone, which acts as a barrier to flow, trends approximately west-northwest from a point just south of The Rigolets through southern West Baton Rouge Parish (Rapp, 1994; Prakken, 2004), and is the approximate southern limit of freshwater in the aquifers (fig. 1).

For the purposes of this report, freshwater is defined as water having less than 250 mg/L of chloride, and most of the water withdrawals described in this report were assumed to be fresh. In 2005, about 18 Mgal/d was withdrawn from the Amite aquifer, primarily for public-supply use (8.4 Mgal/d) and industrial use (9.6 Mgal/d). During this same period, about 32 Mgal/d was withdrawn from the "2,800-foot" sand, primarily for public-supply use (13 Mgal/d) and industrial use (19 Mgal/d). Public-supply and industrial withdrawals from the Amite aquifer and the "2,800-foot" sand are listed in table 1 (B.P. Sargent, U.S. Geological Survey, written commun., 2006).

Table 1. Withdrawal rates for public-supply and industrial use, by parish, for the Amite aquifer and "2,800-foot" sand of the Baton Rouge area in southeastern Louisiana, 2005.

[Source: B.P. Sargent, U.S. Geological Survey, written commun., 2006]

Parish	Annual amount, in million gallons per day			
	Public-supply use	Industrial use	Public-supply use plus industrial use	Total, all uses[1]
Amite aquifer				
St. Tammany	0.3843	0.0000	0.3843	0.3843
Tangipahoa	3.9101	.0000	3.9101	3.9478
Washington	4.1472	9.6511	13.7983	13.7983
Total	**8.4416**	**9.6511**	**18.0927**	**18.1304**
"2,800-Foot" sand of the Baton Rouge area				
East Baton Rouge	9.2108	18.8267	28.0375	28.0753
East Feliciana	1.4715	.0000	1.4715	1.4741
Pointe Coupee	1.2669	.0079	1.2748	1.3286
St. Helena	.3642	.0000	0.3642	.3642
West Feliciana	.6530	.4205	1.0735	1.1570
Total	**12.9664**	**19.2551**	**32.2215**	**32.3992**

[1]All uses include industrial, public-supply, power generation, rural domestic, livestock, irrigation, and aquaculture.

According to data from the Louisiana State Census Data Center (2003), some of the largest population increases in the State during the period 1990 to 2000 occurred in St. Tammany (32.4 percent), Livingston (30.2 percent), and Tangipahoa (17.4 percent) Parishes. These population increases have been accompanied by increased withdrawals of ground water during the same period (Lovelace, 1991; Sargent, 2002): 40 percent in St. Tammany Parish, 63 percent in Livingston Parish, and 35 percent in Tangipahoa Parish (Prakken, 2004). An increase in population in these parishes is expected from population displacement due to damages from Hurricanes Katrina and Rita crossing the Louisiana coast in August and September of 2005 (U.S. Census Bureau, 2006).

Additional information about ground-water flow and effects of increased withdrawals on water levels in the Amite aquifer and the "2,800-foot" sand is needed to assess ground-water-development potential and to protect this resource. To meet this need, the U.S. Geological Survey, in cooperation with the Louisiana Department of Transportation and Development, began a study in 2005 to determine water levels, flow direction, and water-level trends for the Amite aquifer and "2,800-foot" sand. This report presents data and a map that describe the generalized potentiometric surface of the Amite aquifer and "2,800-foot" sand in southeastern Louisiana. Graphs of water levels in selected wells and a table of withdrawals from the Amite aquifer and "2,800-foot" sand show historical changes in water levels and water use. The generalized potentiometric-surface map illustrates the water levels and ground-water flow directions for June–August 2006. These data are on file at the USGS office in Baton Rouge, Louisiana.

Description of Study Area

The study area (fig. 1) is located in southeastern Louisiana and covers all or parts of the following parishes: East Baton Rouge, East Feliciana, Livingston, Pointe Coupee, St. Helena, St. Tammany, Tangipahoa, Washington, and West Feliciana. St. Tammany, Tangipahoa, and Washington Parishes also are known as the eastern Florida Parishes. The study area is bounded approximately by the western boundaries of Pointe Coupee and East Baton Rouge Parishes to the west, the Louisiana-Mississippi state line to the north, the Pearl River to the east, and the Baton Rouge fault to the south. The largest population centers in the study area are the Baton Rouge metropolitan area, Slidell, the Covington-Mandeville area, Hammond, and Bogalusa (Louisiana Department of Transportation and Development, 2005).

Land-surface altitudes generally are higher in the northern part of the study area and decrease toward the south. Land-surface altitude ranges from about 10 ft above NGVD 29 in the backswamp areas of East Baton Rouge Parish, near the Mississippi River, to more than 340 ft above NGVD 29 in East and West Feliciana Parishes.

The climate in the study area is humid subtropical. The average annual temperature for the area is about 69 °F (National Oceanic and Atmospheric Administration, 2005a), and the average annual rainfall is about 64 in/yr (National Oceanic and Atmospheric Administration, 2005b).

Acknowledgments

The cooperation of municipal, industrial, and private well owners during data collection was greatly appreciated. Special thanks to Zahir "Bo" Bolourchi, Director, Water Resources Programs, Louisiana Department of Transportation and Development, for providing water-well registration data and assistance in the publication of this report.

Hydrogeology

The Amite aquifer in St. Tammany, Tangipahoa, and Washington Parishes and the "2,800-foot" sand in East Baton Rouge, East Feliciana, Livingston, Pointe Coupee, St. Helena, and West Feliciana Parishes are part of the Jasper equivalent aquifer system of southeastern Louisiana and are of Miocene age (fig. 2). The aquifer system was deposited as an off-lapping sequence of continental, deltaic, and marine sediments along the northern flank of the Gulf Coast geosyncline. As shown in figure 2, the Amite aquifer is correlative with the "2,800-foot" sand. In the eastern Florida Parishes, the Amite aquifer lies between the overlying Hammond aquifer and underlying Ramsay aquifer. In the Baton Rouge area, the "2,800-foot" sand lies between the overlying "2,400-foot" sand and an underlying unnamed confining unit. The Jasper equivalent aquifer system generally dips in a southerly direction about 30 ft/mi or less in the outcrop areas (southern Mississippi and the northern half of the study area) and shallow subsurface and increases southward, reaching 100 ft/mi or more at depths of 2,000 to 3,000 ft (Martin and others, 1988).

The Amite aquifer is one of the most continuous aquifers in St. Tammany, Tangipahoa, and Washington Parishes. The aquifer thickness typically ranges from 100 to 150 ft, but becomes increasingly varied to the south where the sand may locally pinch out or thicken within short distances. Sediment samples from the Amite aquifer contain moderately well-sorted medium sand at the town of Amite and grade from fine to medium sand in the upper half of the aquifer to medium to coarse sand in the lower half near Tickfaw. The Amite aquifer ranges in depth from 1,200 ft below land surface near Kentwood to 3,200 ft below land surface near Lacombe. The aquifer is absent locally between Hammond and Covington, and south of Ponchatoula (Nyman and Fayard, 1978, pl. 11). Recharge to the aquifer is principally through the shallow aquifer in southern Mississippi (Nyman and Fayard, 1978, p. 54). Water in the Amite aquifer is salty (greater than 250 mg/L chloride) south of a line through Ponchatoula and the town of Pearl River (fig. 1) (Nyman and Fayard, 1978).

The deepest freshwater-bearing aquifer in the Baton Rouge area is the "2,800-foot" sand, so named based on its depth of occurrence at a well in the Baton Rouge industrial district. Samples from the "2,800-foot" sand in the industrial district consist of coarse to medium, yellowish-gray, poorly sorted sand with small amounts of granule gravel (Meyer and Turcan, 1955). Although the aquifer is irregular and contains clay beds locally, it appears to form a relatively continuous water-bearing formation throughout the area (Meyer and Turcan, 1955). The "2,800-foot" sand is areally extensive (Smith, 1976) and ranges in thickness from 190 to 350 ft (Morgan, 1963). Water in the lower part of the "2,800-foot" sand is salty (greater than 250 mg/L of chloride) in the industrial district, and the aquifer is entirely salty south of the Baton Rouge fault.

CONVERSION FACTORS, DATUMS, AND ABBREVIATED WATER-QUALITY UNIT

Multiply	By	To obtain
Length		
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
Flow rate		
inch per year (in/yr)	25.4	millimeter per year (mm/yr)
foot per year (ft/yr)	0.3048	meter per year (m/yr)
million gallons per day (Mgal/d)	3,785	cubic meter per day (m^3/d)
Hydraulic gradient		
foot per mile (ft/mi)	0.1894	meter per kilometer (m/km)

Temperature in degrees Fahrenheit (°F) can be converted to degrees Celsius (°C) as follows:
°C = (°F - 32)/1.8.
Vertical coordinate information in this report is referenced to the National Geodetic Vertical Datum of 1929 (NGVD 29).
Horizontal coordinate information in this report is referenced to the North American Datum of 1927.

Abbreviated water-quality unit:
milligrams per liter (mg/L)

Base map modified from Louisiana Oil Spill Coordinator, Office of the Governor, Louisiana GIS CD: A digital Map of the State, Version 2.0

Figure 1. Generalized potentiometric surface of the Amite aquifer and "2,800-foot" sand of the Baton Rouge area in southeastern Louisiana, June–August 2006.

System	Series	Stratigraphic unit	Hydrogeologic unit: Aquifer system or confining unit	Hydrogeologic unit: Aquifer or confining unit — Baton Rouge area[1]	Hydrogeologic unit: Aquifer or confining unit — Eastern Florida Parishes: St. Tammany, Tangipahoa, and Washington Parishes
Quaternary	Holocene	Mississippi River and other alluvial deposits	Near-surface aquifers or surficial confining unit	Mississippi River alluvial aquifer	Shallow sands
Quaternary	?		?		
Quaternary	Pleistocene	Unnamed Pleistocene deposits	Chicot equivalent aquifer system or surficial confining unit	Shallow sands	Upland terrace aquifer
Quaternary	Pleistocene	Unnamed Pleistocene deposits	Chicot equivalent aquifer system or surficial confining unit	Upland terrace aquifer: "400-foot" sand	Upper Ponchatoula aquifer
Quaternary	Pleistocene	Unnamed Pleistocene deposits	Chicot equivalent aquifer system or surficial confining unit	Upland terrace aquifer: "600-foot" sand	Upper Ponchatoula aquifer
Tertiary	Pliocene	Fleming Formation, Blounts Creek Member	Southern Hills regional aquifer system[2] — Evangeline equivalent aquifer system or surficial confining unit	"800-foot" sand; "1,000-foot" sand	Lower Ponchatoula aquifer
Tertiary	?	Fleming Formation, Blounts Creek Member	Southern Hills regional aquifer system[2] — Evangeline equivalent aquifer system or surficial confining unit	"1,200-foot" sand	Big Branch aquifer
Tertiary	Pliocene	Fleming Formation, Blounts Creek Member	Southern Hills regional aquifer system[2] — Evangeline equivalent aquifer system or surficial confining unit	"1,500-foot" sand	Kentwood aquifer system: Kentwood aquifer; Abita aquifer; Covington aquifer
Tertiary	Pliocene	Fleming Formation, Blounts Creek Member	Southern Hills regional aquifer system[2] — Evangeline equivalent aquifer system or surficial confining unit	"1,700-foot" sand	Kentwood aquifer system: Slidell aquifer
Tertiary	Pliocene	Fleming Formation, Castor Creek Member	Unnamed confining unit	Unnamed confining unit	
Tertiary	Miocene	Fleming Formation, Williamson Creek Member, Dough Hills Member, Carnahan Bayou Member	Southern Hills regional aquifer system[2] — Jasper equivalent aquifer system	"2,000-foot" sand	Tchefuncte aquifer
Tertiary	Miocene	Fleming Formation, Williamson Creek Member, Dough Hills Member, Carnahan Bayou Member	Southern Hills regional aquifer system[2] — Jasper equivalent aquifer system	"2,400-foot" sand	Hammond aquifer
Tertiary	Miocene	Fleming Formation, Williamson Creek Member, Dough Hills Member, Carnahan Bayou Member	Southern Hills regional aquifer system[2] — Jasper equivalent aquifer system	"2,800-foot" sand	Amite aquifer
Tertiary	Miocene	Fleming Formation, Williamson Creek Member, Dough Hills Member, Carnahan Bayou Member	Southern Hills regional aquifer system[2] — Jasper equivalent aquifer system		Ramsay aquifer
Tertiary	Miocene	Fleming Formation, Lena Member	Unnamed confining unit	Unnamed confining unit	
Tertiary	?	Catahoula Formation	Catahoula equivalent aquifer system	Catahoula aquifer	Franklinton aquifer
Tertiary	Oligocene	Catahoula Formation	Catahoula equivalent aquifer system	Catahoula aquifer	Franklinton aquifer

[1] East Baton Rouge, East Feliciana, Livingston, Pointe Coupee, St. Helena, West Baton Rouge, and West Feliciana Parishes.
[2] Buono, 1983.

Figure 2. Partial stratigraphic column of hydrologic units in southeastern Louisiana (modified from Nyman and Fayard, 1978, table 2; Stuart and others, 1994, fig. 5; Lovelace and Lovelace, 1995, fig. 1; Griffth, 2003, fig. 3; Prakken, 2004, fig. 1).

Generalized Potentiometric Surface

A generalized potentiometric-surface map was constructed for the Amite aquifer and the "2,800-foot" sand using water-level data from 62 wells. The most recent potentiometric-surface map constructed for these two aquifers was by Martin and others (1988) using water-level data collected in 1984. Water levels were measured in June–August 2006. Wells in which water levels were measured were not being pumped at the time of measurement. Wells with water levels below land surface were measured using either a steel or electric tape marked in 0.01-ft increments. Wells under flowing artesian conditions (water from the well is flowing at land surface) were measured using a calibrated pressure gage. Flowing artesian wells were located in parts of St. Tammany, Tangipahoa, and Washington Parishes (fig. 1 and table 2). Water-level data are listed in table 2.

A potentiometric-surface map may be used to determine direction of ground-water flow, areas of recharge and discharge, and the effects of withdrawals upon the ground-water system. The rate of ground-water movement also can be estimated from the gradient, when used with other hydrologic information (Freeze and Cherry, 1979).

Ground water moves from areas of higher hydraulic head to areas of lower hydraulic head. Arrows, drawn perpendicular to the equipotential lines, are shown on the potentiometric-surface map (fig. 1) and indicate the general direction of ground-water movement in the aquifers. Under pre-development conditions, regional water flow in the Amite aquifer and the "2,800-foot" sand was primarily southward from the upland areas in the northern part of the study area, where water levels were the highest, to lowland areas in the south and toward the valleys of the Mississippi and Pearl Rivers (Martin and others, 1988).

Currently (2006), water movement in the Amite aquifer is generally toward the south and toward withdrawal centers in the eastern Florida Parishes. In St. Tammany Parish, ground-water movement is generally to the south; in Tangipahoa Parish, it is generally south-southwest toward the withdrawal center located near the town of Amite (fig. 1). In Washington Parish, ground-water movement is generally east-southeast toward the withdrawal center located at Bogalusa. Water movement in the "2,800-foot" sand in West Feliciana and Pointe Coupee Parishes is generally to the south and southeast toward withdrawal centers in East Baton Rouge Parish. In East Feliciana, Livingston, and St. Helena Parishes, ground-water flow is generally south-southwest toward withdrawal centers in East Baton Rouge Parish.

Water levels generally were highest in the northern part of the study area, declining southward and near withdrawal centers. In June–August 2006, measured water levels ranged from 102.35 ft above NGVD 29 in well Ta-584, located in north-central Tangipahoa Parish, to 49.25 ft below NGVD 29 in well EB-1247, located in northwestern East Baton Rouge Parish (fig. 1). Water levels were used to determine where cones of depression were located in the study area.

Cones of depression have formed near Bogalusa in Washington Parish and in the northwestern part of East Baton Rouge Parish because of ground-water withdrawals. In the eastern half of Washington Parish, ground water flows radially toward the cone of depression at the town of Bogalusa. Although large volumes of water (more than 7.0 Mgal/d) are withdrawn from the "2,800-foot" sand around metropolitan Baton Rouge, the pumpage is widely distributed throughout numerous sites, and the resulting cone of depression is widespread but relatively shallow. These cones of depression are shown in figure 1.

Water-Level Trends

Long-term water-level declines in the Amite aquifer and the "2,800-foot" sand have occurred in response to water withdrawals in the study area. Hydrographs illustrating water-level trends in the two aquifers are shown in figures 3A–3F. The largest water-level declines occurred at wells in Bogalusa (Washington Parish) and the northwestern part of East Baton Rouge Parish. Large amounts of water were withdrawn for industrial use in these two parishes (almost 10 Mgal/d in Washington Parish and more than 18 Mgal/d in East Baton Rouge Parish) (table 1). Water levels at well Wa-158, screened in the Amite aquifer and located near the withdrawal center in Bogalusa, declined about 1.5 ft/yr during the period 1986 to 2006 (fig. 3A). Water levels at well EB-1000, screened in the "2,800-foot" sand and located near the Baton Rouge industrial district, about 9 mi southeast of the withdrawal center, declined about 1.5 ft/yr during the period 1986 to 2006 (fig. 3B).

Water levels in the Amite aquifer, in wells in outlying areas of St. Tammany and Tangipahoa Parishes, declined less than 1 ft/yr during the period 1986 to 2006, as shown in the hydrograph of well Ta-260 (fig. 3C). This well is located in west-central Tangipahoa Parish, at Roseland, about 2.5 mi north of the town of Amite (fig. 1).

For the period 1986 to 2006, water levels from wells EB-944 (fig. 3D) screened in the "2,800-foot" sand and located about 13 mi south and east of the withdrawal center in the northwestern part of East Baton Rouge Parish (fig. 1), declined about 1.5 ft/yr. The water levels in well EB-581, located in the far east-central part of the parish more than 18 mi from the withdrawal center, declined about 1.4 ft/yr (fig. 3E).

Water levels in the "2,800-foot" sand in wells in outlying areas of Pointe Coupee Parish declined less than 1 ft/yr over the past 20 years. In northern Pointe Coupee Parish, water levels declined about 0.6 ft/yr and appear to fluctuate seasonally as shown in the hydrograph of well PC-143 (fig. 3F). This well is located about 26 mi northwest of the withdrawal center located in the northwestern part of East Baton Rouge Parish.

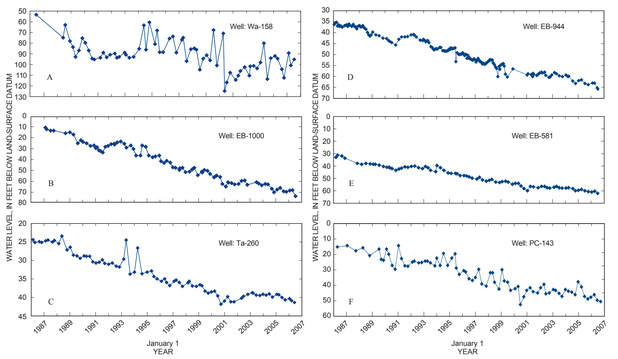

Figure 3. Water levels in selected wells screened in the Amite aquifer and "2,800-foot" sand of the Baton Rouge area in southeastern Louisiana.

Table 2. Water-level data used to construct the potentiometric-surface map of the Amite aquifer and "2,800-foot" sand of the Baton Rouge area in southeastern Louisiana, June–August 2006.

[NGVD 29, National Geodetic Vertical Datum of 1929]

Well number	Altitude of land surface, in feet above NGVD 29	Date measured	Depth to water level, in feet above or below (-) land surface[1]	Altitude of water level, in feet above or below (-) NGVD 29
Amite aquifer				
ST-592	27	8-28	49.70	76.7
ST-726	140	8-28	-48.77	91.23
ST-1138	25	6-01	-54.80	79.8
Ta-259	114	8-22	-46.71	67.29
Ta-260	131	7-24	-41.37	89.63
Ta-269	85	6-05	10.50	95.5
Ta-293	52	6-01	11.40	63.4
Ta-730	40	6-09	30.80	70.8
Ta-525	40	6-09	44.30	84.3
Ta-584	240	6-01	-137.65	102.35
Ta-822	100	8-28	-34.35	65.65
Ta-827	195	8-28	-110.79	84.21
Wa-55	95	6-08	-111.90	-16.9
Wa-56	97	6-08	-115.17	-18.17
Wa-93	100	6-08	-109.58	-9.58
Wa-125	150	7-25	-104.33	45.67
Wa-158	97	7-25	-92.54	4.46
Wa-5926Z	65	7-25	28.42	93.42
"2,800-Foot" sand of the Baton Rouge area				
EB-468	73	7-06	-86.81	-13.81
EB-551	75	6-13	-87.59	-12.59
EB-581	67	6-09	-61.80	5.2
EB-700	62	6-06	-68.50	-6.5
EB-730	60	6-06	-74.01	-14.01
EB-750	60	6-13	-71.12	-11.12
EB-754	78	6-13	-91.82	-13.82
EB-829	110	6-06	-112.32	-2.32
EB-830	90	6-06	-99.42	-9.42
EB-832	87	6-06	-85.08	1.92
EB-922	66	6-06	-79.82	-13.82
EB-944	59	7-12	-65.71	-6.71
EB-995	57	6-06	-58.04	-1.04
EB-1000	68	6-09	-75.71	-7.71
EB-1186	109	6-22	-119.53	-10.53
EB-1247	97	7-19	-146.25	-49.25
EB-1311	115	6-06	-116.01	-1.01
EF-223	135	7-13	-140.35	-5.35
EF-249	180	6-19	-138.35	41.65
EF-254	252	8-29	-227.40	24.6
EF-259	240	6-19	-199.03	40.97
EF-185	228	7-13	-212.07	15.93
EF-302	272	6-19	-240.30	31.7
Li-91	44	8-08	-37.41	6.59
PC-20B	36	7-28	-24.25	11.75
PC-65	34	7-28	-31.48	2.52
PC-85	32	6-22	-10.63	21.37
PC-114	32	7-31	-19.31	12.69
PC-119	32	7-28	-22.57	9.43
PC-143	41	7-14	-16.60	24.4
PC-214	31	7-17	-17.63	13.37
PC-257	25	7-17	-12.24	12.76
PC-262	35	7-17	-25.44	9.56
PC-301	38	7-31	-20.49	17.51
PC-321	28	6-21	-20.08	7.92
SH-21	250	8-08	-186.73	63.27
SH-40	131	8-08	-67.90	63.1
SH-67	190	8-08	-119.80	70.2
SH-116	305	8-08	-237.69	67.31
SH-122	196	8-08	-117.53	78.47
WF-235	162	6-20	-165.92	-3.92
WF-274	220	7-13	-219.52	.48
WF-290	188	6-16	-190.09	-2.09
WF-291	250	6-16	-218.04	31.96

[1]A positive depth below land surface indicates water level is above land surface.

Selected References

Breakfield, Steve, 1995, Office of Mineral Resources report on Lake Pontchartrain: Baton Rouge, La., Louisiana Department of Natural Resources Memorandum, 15 p.

Buono, Anthony, 1983, The Southern Hills regional aquifer system of southeastern Louisiana and southwestern Mississippi: U.S. Geological Survey Water-Resources Investigations Report 83–4189, 38 p.

Cardwell, G.T., Forbes, M.J., Jr., and Gaydos, M.W., 1967, Water resources of the Lake Pontchartrain area, Louisiana: Department of Conservation, Louisiana Geological Survey, and Louisiana Department of Public Works Water Resources Bulletin no. 12, 105 p.

Case, H.L., III, 1979, Ground-water resources of Washington Parish, Louisiana: Louisiana Department of Transportation and Development, Office of Public Works Water Resources Technical Report no. 18, 33 p.

Compton, R.R., 1985, Geology in the field: New York, John Wiley and Sons, 398 p.

Dial, D.C., and Sumner, D.M., 1989, Geohydrology and simulated effects of pumpage on the New Orleans aquifer system at New Orleans, Louisiana: Louisiana Department of Transportation and Development Water Resources Technical Report no. 46, 54 p.

Freeze, R.A., and Cherry, J.A., 1979, Groundwater: Englewood Cliffs, N.J., Prentice-Hall, Inc., 604 p.

Griffith, J.M., 2003, Hydrogeologic framework of southeastern Louisiana: Louisiana Department of Transportation and Development Water Resources Technical Report no. 72, 21 p., 18 pls.

Hanor, J.S., 1982, Reactivation of fault movement, Tepetate fault zone, south central Louisiana, *in* Transactions of the Gulf Coast Association of Geological Societies: Gulf Coast Association of Geological Societies, v. 32, p. 237–245.

Louisiana Department of Transportation and Development, 2005, 2004 Official highway map of Louisiana: accessed May 31, 2007, at URL *http://www.dotd.state.la.us/maps/2004_Official_Louisiana_Highway_Map.PDF*

Louisiana State Census Data Center, 2003, Census 2000: accessed March 7, 2006, at URL *http://www.doa.louisiana.gov/census/ 2000/2000countychange.htm*

Lovelace, J.K., 1991, Water use in Louisiana, 1990: Louisiana Department of Transportation and Development Water Resources Special Report no. 6, 131 p.

Lovelace, J.K., and Lovelace, W.M., 1995, Hydrogeologic unit nomenclature and computer codes for aquifers and confining units in Louisiana: Louisiana Department of Transportation and Development Water Resources Special Report no. 9, 12 p.

Martin, Angel, Jr., Whiteman, C.D., Jr., and Becnel, M.J., 1988, Generalized potentiometric surfaces of the upper and lower Jasper and equivalent aquifers in Louisiana, 1984: U.S. Geological Survey Water-Resources Investigations Report 87–4139, 2 sheets.

McCulloh, R.P., 1991, Surface faults in East Baton Rouge Parish: Baton Rouge, La., Louisiana Geological Survey Open-File series 91–02, 25 p.

Meyer, R.R., and Turcan, A.N., Jr., 1955, Geology and ground-water resources of the Baton Rouge area Louisiana: U.S. Geological Survey Water-Supply Paper 1296, 138 p.

Morgan, C.O., 1963, Ground-water resources of East Feliciana and West Feliciana Parishes, Louisiana: Louisiana Department of Public Works, 58 p.

Murray, G.E., 1961, Geology of the Atlantic and Gulf Coastal Province of North America: New York, Harper Brothers, 692 p.

National Oceanic and Atmospheric Administration, 2005a, Temperature: accessed November 29, 2006, at URL *http://www.ncdc.noaa.gov/oa/climate/online/ccd/nrmavg.txt*

National Oceanic and Atmospheric Administration, 2005b, Precipitation: accessed November 29, 2006, at URL *http://www.ncdc.noaa.gov/oa/climate/online/ccd/nrmpcp.txt*

Nyman, D.J., and Fayard, L.D., 1978, Ground-water resources of Tangipahoa and St. Tammany Parishes, southeastern Louisiana: Louisiana Department of Transportation and Development, Office of Public Works Water Resources Technical Report no. 15, 76 p., 13 pls.

Prakken, L.B., 2004, Louisiana ground-water map no. 17: Generalized potentiometric surface of the Kentwood aquifer system and the "1,500-foot" and "1,700-foot" sands of the Baton Rouge area in southeastern Louisiana, March–April 2003: U.S. Geological Survey Scientific Investigations Map 2862, 2 sheets.

Rapp, T.R., 1994, Ground-water resources of southern Tangipahoa Parish and adjacent areas, Louisiana: U.S. Geological Survey Water-Resources Investigations Report 92–4182, 47 p.

Sargent, B.P., 2002, Water use in Louisiana, 2000: Louisiana Department of Transportation and Development Water Resources Special Report no. 15, 133 p.

Smith, C.G., 1976, Saltwater-freshwater interfaces in the "2000-" and "2,800-foot" sands in the Capital Area Ground Water Conservation District: Capital Area Ground Water Conservation Commission Bulletin no. 1, 23 p.

Stuart, C.G., Knochenmus, Darwin, and McGee, B.D., 1994, Guide to Louisiana's ground-water resources: U.S. Geological Survey Water-Resources Investigations Report 94–4085, 55 p.

Tomaszewski, D.J., 1988, Ground-water hydrology of Livingston, St. Helena, and parts of Ascension and Tangipahoa Parishes, southeastern Louisiana: Louisiana Department of Transportation and Development Water Resources Technical Report no. 43, 54 p.

U.S. Census Bureau, 2006, Special population estimates for impacted counties in the Gulf Coast area: accessed January 8, 2007, at URL *http://www.census.gov/Press-Release/www/emergencies/gulfcoast_impact_estimates.xls*

Winner, M.D., Jr., Forbes, M.J., Jr., and Broussard, W.L., 1968, Water resources of Pointe Coupee Parish, Louisiana: Department of Conservation, Louisiana Geological Survey, and Louisiana Department of Public Works Water Resources Bulletin no. 11, 110 p.

U.S. Geological Survey — Louisiana Department of Transportation and Development Water Resources Cooperative Program

USGS science for a changing world

LOUISIANA GROUND-WATER MAP NO. 22:
GENERALIZED POTENTIOMETRIC SURFACE OF THE AMITE AQUIFER AND THE "2,800-FOOT" SAND OF THE BATON ROUGE AREA IN SOUTHEASTERN LOUISIANA, JUNE–AUGUST 2006

By
Robert B. Fendick, Jr.

2007

For additional information, contact:

Director, U.S. Geological Survey
Louisiana Water Science Center
3535 S. Sherwood Forest Blvd., Suite 120
Baton Rouge, Louisiana 70816
E-mail: dc_la@usgs.gov
Fax: (225) 298-5490
Telephone: (225) 298-5481
Home Page: http://la.water.usgs.gov

Copies of this report can be purchased from:

U.S. Geological Survey, Information Services
Box 25286, Denver Federal Center
Denver, CO 80225
E-mail: infoservices@usgs.gov
Fax: (303) 202-4188
Telephone: 1-888-ASK-USGS
Home Page: http://www.usgs.gov

Publishing support provided by:
Lafayette Publishing Service Center