

In cooperation with the Louisiana Department of Transportation and Development

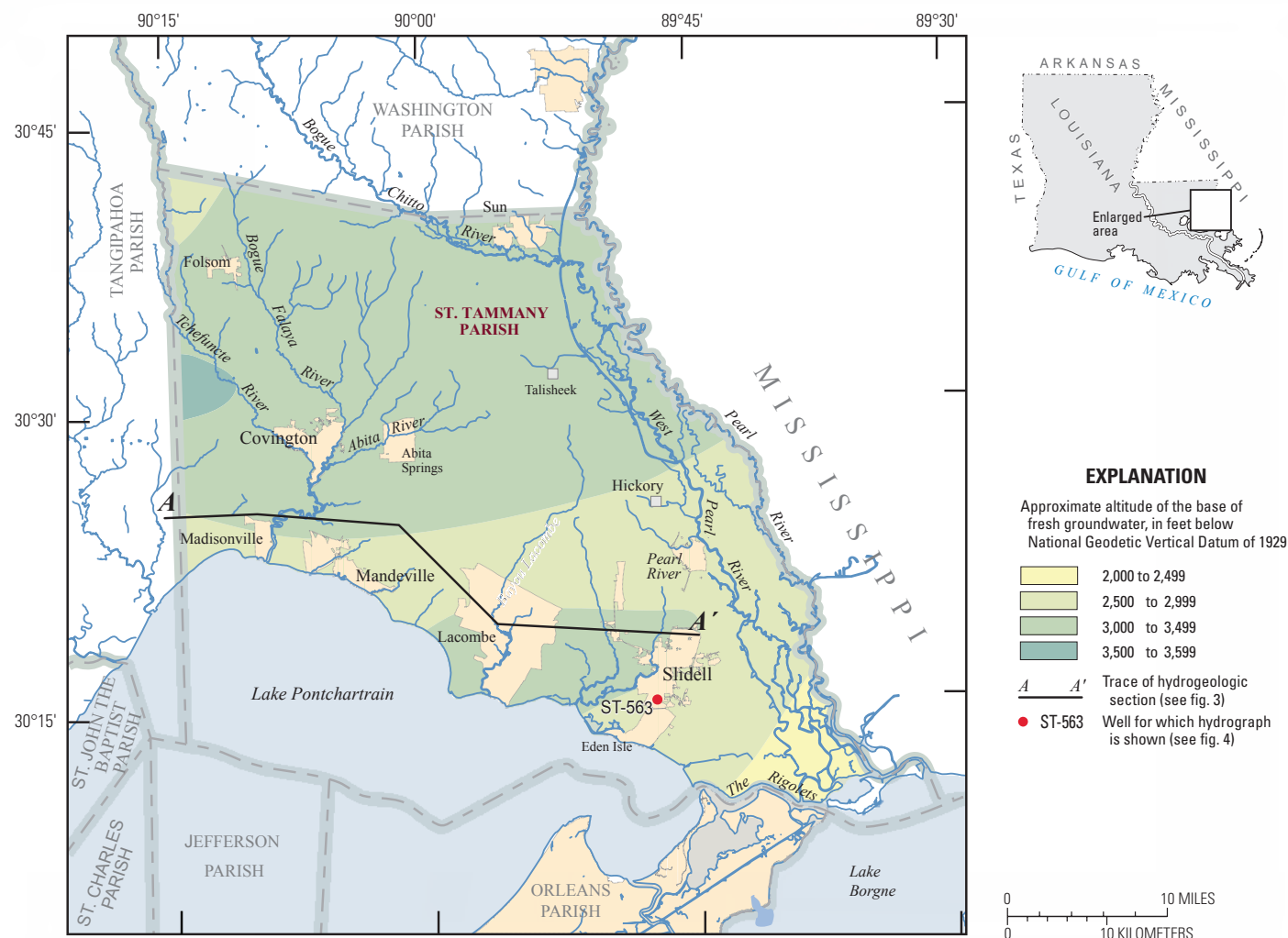
# Water Resources of St. Tammany Parish, Louisiana

## Introduction

St. Tammany Parish, located in southeastern Louisiana (fig. 1), contains fresh groundwater and surface-water resources. In 2005, about 22.8 million gallons per day (Mgal/d) were withdrawn from water sources in St. Tammany Parish (fig. 2). Almost 100 percent (22.7 Mgal/d) was withdrawn from groundwater, and less than 1 percent (0.06 Mgal/d) was withdrawn from surface water (table 1). Withdrawals for public

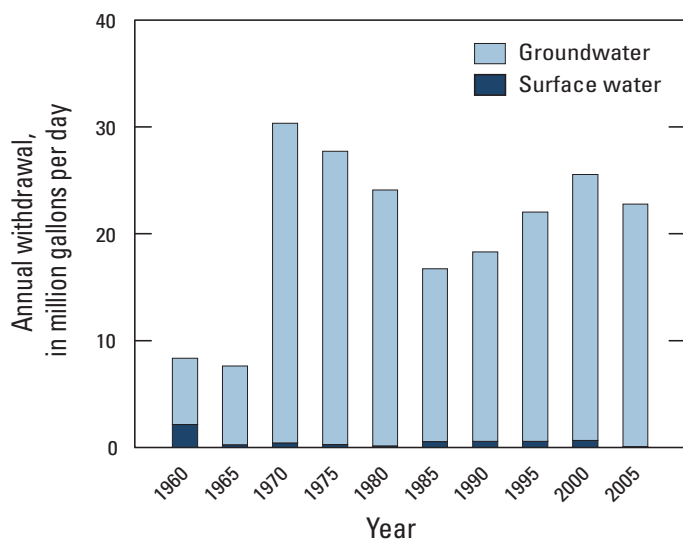
supplies accounted for 70 percent (16 Mgal/d) of the total water withdrawn (table 2). Withdrawals for domestic use were 28 percent (6 Mgal/d). Generally, water withdrawals in the parish increased from 1960 to 1970, decreased from 1970 to 1985, and again increased from 1985 to 2005 (fig. 2).

This fact sheet summarizes basic information on the water resources of St. Tammany Parish, La. Information on groundwater and surface-water availability, quality, development, use, and trends is based on previously published reports listed in the references section.



Base modified from Official Map of Louisiana, Louisiana Department of Transportation and Development, 1986

**Figure 1.** Location of study area, St. Tammany Parish, Louisiana.



**Figure 2.** Water withdrawals in St. Tammany Parish, Louisiana, 1960–2005.

**Table 1.** Water withdrawals, in million gallons per day, by source in St. Tammany Parish, Louisiana, 2005 (Sargent, 2007).

Aquifer, aquifer system, or major water body	Groundwater	Surface water
Chicot equivalent aquifer system	0.99	
Evangeline equivalent aquifer system	12.32	
Jasper equivalent aquifer system	4.39	
Surface water bodies		0.06
<b>Total</b>	<b>22.7</b>	<b>0.06</b>

**Table 2.** Water withdrawals, in million gallons per day, by category in St. Tammany Parish, Louisiana, 2005 (Sargent, 2007).

	Groundwater	Surface water	Total
Public supply	15.89	0	15.89
Industrial	0.14	0	0.14
Power generation	0	0	0
Rural domestic	6.44	0	6.44
Livestock	0.06	0.04	0.11
Rice irrigation	0	0	0
General irrigation	0.13	0.01	0.15
Aquaculture	0.03	0	0.03
<b>Total</b>	<b>22.7</b>	<b>0.06</b>	<b>22.76</b>

## Groundwater Resources

The groundwater resources of St. Tammany Parish, from near surface to deepest, include the Chicot equivalent aquifer system, the Evangeline equivalent aquifer system, and the Jasper equivalent aquifer system (fig. 3). Aquifers in the parish generally dip and thicken to the south. Recharge to the aquifers is from rainfall, leakage from overlying aquifers, and seasonal input from rivers. Discharge from the aquifers is by natural flow

into rivers, leakage into underlying aquifers, and withdrawal from wells.

Fresh groundwater (water with a chloride concentration less than 250 milligrams per liter [mg/L]) is present from land surface to about 3,000 to 3,500 ft below National Geodetic Vertical Datum of 1929 (NGVD 29) in most of northern St. Tammany Parish (fig. 1) and to about 2,400 to 3,200 ft below NGVD 29 in southeastern parts of the parish; however, some intermediate sands at depths less than 2,500 ft near Lake Pontchartrain may contain saltwater (water with a chloride concentration that exceeds 250 mg/L). Freshwater from aquifers in St. Tammany Parish is soft (less than 60 mg/L, as calcium carbonate [ $\text{CaCO}_3$ ]) and generally does not exceed the U.S. Environmental Protection Agency's (EPA) 2006 Secondary Maximum Contaminant Levels (SMCLs)<sup>1</sup> for drinking water for chloride, iron, manganese, and dissolved solids. Some aquifers may contain iron or manganese concentrations that exceed the EPA's SMCLs.

Well-registration records from the Louisiana Department of Transportation and Development (DOTD) indicate that there are about 10,866 active wells screened in the aquifers in St. Tammany Parish, including about 9,740 domestic, 657 public-supply, 431 irrigation, and 38 industrial wells. About 23 Mgal/d of groundwater was withdrawn in St. Tammany Parish in 2005, and most was for public-supply (16 Mgal/d) and domestic (6 Mgal/d) use.

## The Chicot Equivalent Aquifer System

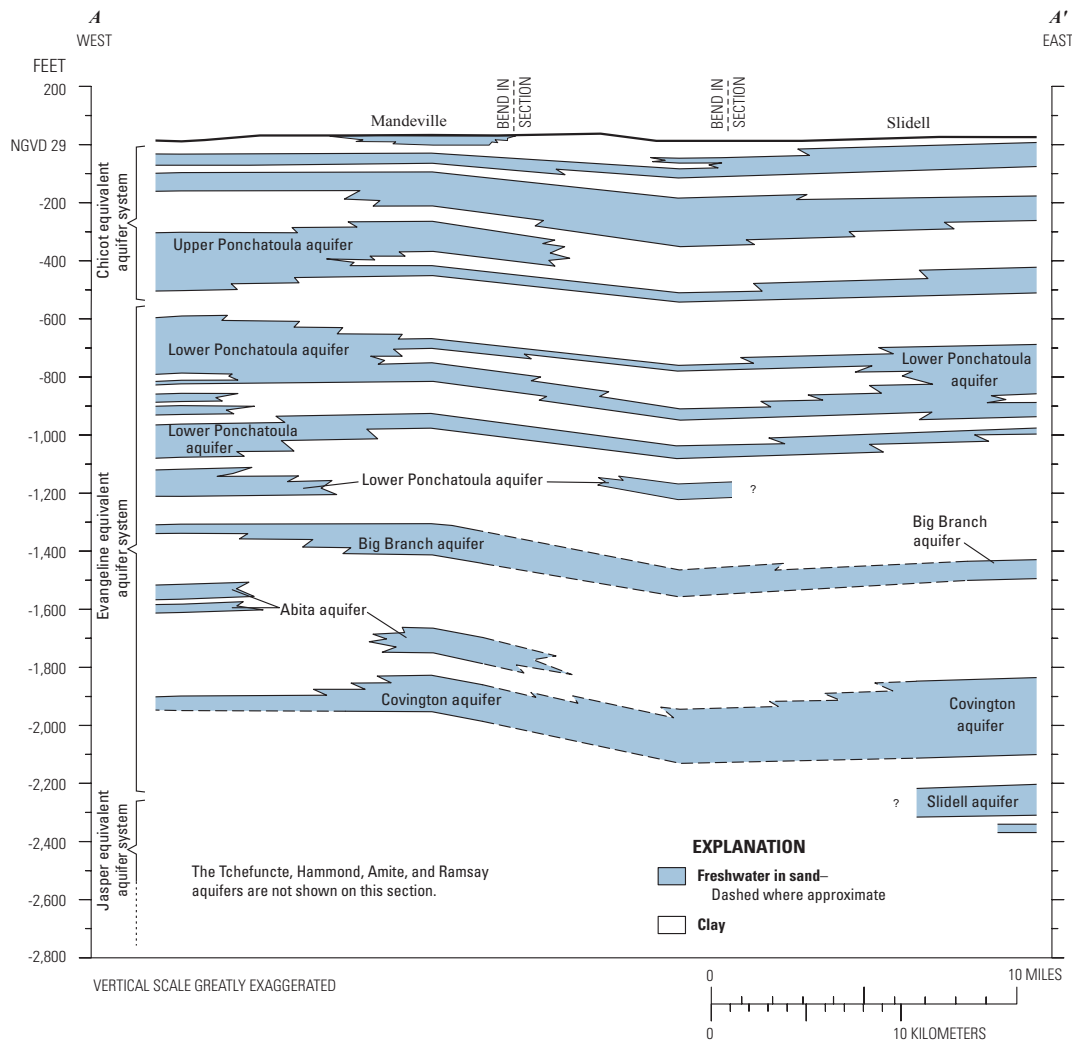
The Chicot equivalent aquifer system in St. Tammany Parish consists of two adjacent, near-surface aquifers: the upland terrace aquifer in the northern half of the parish and the upper Ponchatoula aquifer in the southern half of the parish. The base of the aquifer system ranges from about 0 to 500 ft below NGVD 29.

In 2005, about 26 percent (6.0 Mgal/d) of the groundwater used in St. Tammany Parish was withdrawn from the Chicot equivalent aquifer system. Most of the water was withdrawn from the upland terrace aquifer (3.8 Mgal/d) and the upper Ponchatoula aquifer (2 Mgal/d). About 5.3 Mgal/d of the total groundwater withdrawn in this system were for domestic use, and about 0.6 Mgal/d were for public-supply use.

The base of the Chicot equivalent aquifer system ranges from about 0 ft below NGVD 29 in northern St. Tammany Parish to 500 ft below NGVD 29 in the southern parts of the parish. Aquifers in the Chicot equivalent aquifer system typically consist of 50- to 300-ft-thick units of sand and gravel.

The Chicot equivalent aquifer system contains water-bearing units throughout St. Tammany Parish. Aquifers in the system typically yield fresh water that is soft and does not exceed the EPA's SMCLs (table 3). Water from aquifers in this system generally exceeds the SMCL for iron, and water from the upland terrace aquifer may exceed the SMCL for manganese.

<sup>1</sup>The SMCLs are nonenforceable Federal guidelines regarding cosmetic effects (such as tooth or skin discoloration) or aesthetic effects (such as taste, odor, or color) of drinking water. At high concentrations or values, health implications as well as aesthetic degradation might exist. SMCLs were established as guidelines for the States by the U.S. Environmental Protection Agency (1992).



**Figure 3.** Generalized west-to-east hydrogeologic section through St. Tammany Parish, Louisiana (Griffith, 2003). Trace of section shown on figure 1.

About 9,299 wells are screened in the Chicot equivalent aquifer system and are used for domestic (8,507), public-supply (408), irrigation (363), or industrial (21) purposes. Reported well yields from wells screened in the aquifer system generally range from about 3 to 80 gallons per minute (gal/min).

## The Evangeline Equivalent Aquifer System

The Evangeline equivalent aquifer system underlies the Chicot equivalent aquifer system and in St. Tammany Parish consists of, from near surface to deepest, the lower Ponchatoula, Big Branch, Abita, Covington, and Slidell aquifers. In 2005, about 54 percent (12.3 Mgal/d) of the groundwater used in the St. Tammany Parish was withdrawn from the Evangeline equivalent aquifer system. Most of the water was withdrawn from the Slidell aquifer (6.5 Mgal/d), the Abita aquifer (2.7 Mgal/d), and the lower Ponchatoula aquifer (2.3 Mgal/d). About 10.4 Mgal/d of the total groundwater withdrawn in this system were for public-supply, and about 1.2 Mgal/d were for domestic use.

The Evangeline equivalent aquifer system contains water-bearing units throughout St. Tammany Parish. The base of

the aquifer system ranges from about 1,800 to possibly about 3,000 ft below NGVD 29 south of Slidell. Aquifers in the Evangeline equivalent aquifer system typically consist of 50- to 200-ft-thick units of medium to very coarse sand.

Freshwater from aquifers in the Evangeline equivalent aquifer system is typically soft and does not generally exceed the EPA's SMCLs; however, some freshwater may contain iron and manganese concentrations that exceed those SMCLs (table 3). Saltwater is present in the Big Branch aquifer near Lacombe and the Lake Pontchartrain shoreline.

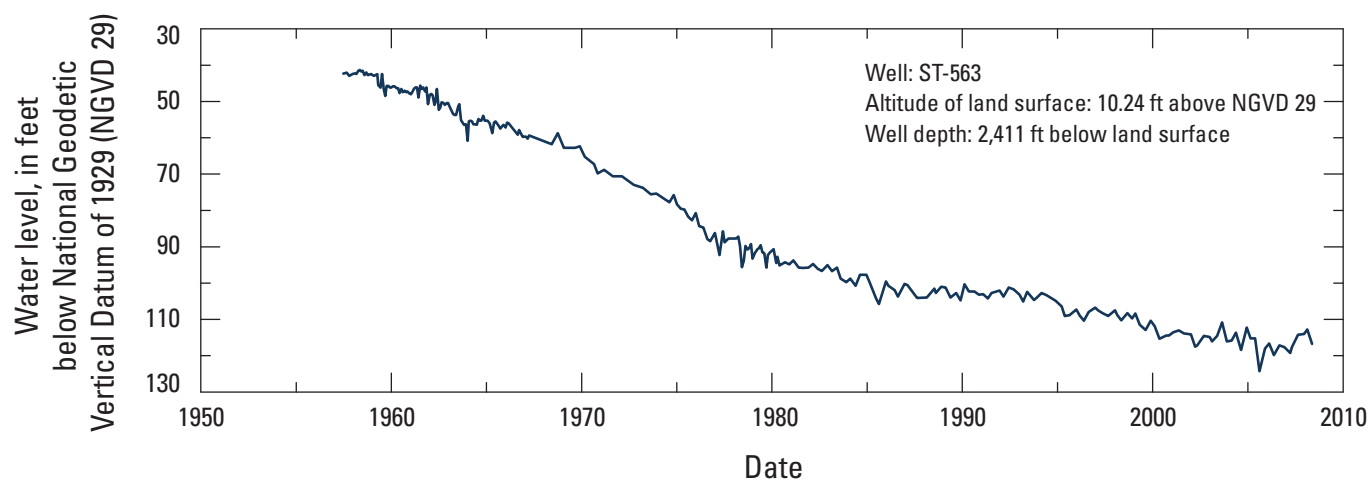
About 1,497 wells are screened in the Evangeline equivalent aquifer system and are used for domestic (1,210), public-supply (213), irrigation (58), or industrial (16) purposes. Reported well yields from wells screened in the Evangeline equivalent aquifer system generally range from about 4 to 300 gal/min.

Water levels in the lower Ponchatoula and Big Branch aquifers are about 20 to 35 ft above NGVD 29 and have declined by as much as about 0.3 ft per year from 1996 to 2005. Water levels in the Abita, Covington, and Slidell aquifers are about 50 to 70 ft above NGVD 29 and have declined by as much as about 1.3 ft per year from 1978 to 2005 (fig. 4).

**Table 3.** Summary of selected water-quality characteristics for freshwater in the Chicot equivalent aquifer system and the Jasper and Evangeline equivalent aquifer systems in St. Tammany Parish, Louisiana, 1939–2007 (U.S. Geological Survey, 2008b).

[Values are in milligrams per liter, except as noted. °C, degrees Celsius; PCU, platinum cobalt units; µS/cm, microsiemens per centimeter; SU, standard units; CaCO<sub>3</sub>, calcium carbonate; µg/L, micrograms per liter; NA, not applicable; SMCL, Secondary Maximum Contaminant Level established by the U.S. Environmental Protection Agency, 2006]

	Temperature (°C)	Color (PCU)	Specific conductance, field (µS/cm at 25 °C)	pH, field (SU)	Hardness (as CaCO <sub>3</sub> )	Chloride, filtered (as Cl)	Iron, filtered (µg/L as Fe)	Manganese, filtered (µg/L as Mn)	Dissolved solids, filtered
Chicot equivalent aquifer system									
Median	22.4	10	256	7.1	12	6.8	165	80	171
10th percentile	21	0	40	5.4	4.7	3.1	<10	0.8	43.8
90th percentile	25	50	584	8.6	24.6	27.2	1,085	170	275.6
Number of samples	46	16	41	27	48	50	18	21	17
Percentage of samples that meet SMCLs	NA	66	NA	45	NA	100	64	46	100
Jasper and Evangeline equivalent aquifer systems									
Median	28.3	5	294.5	8.5	6	4	50	30	195
10th percentile	23	0	182.2	7	1	2.4	6	<10	145.1
90th percentile	34.6	35	634.8	9	20	25	855	190	394.4
Number of samples	100	76	108	81	104	131	66	60	72
Percentage of samples that meet SMCLs	NA	76	NA	48	NA	100	83	62	99
SMCLs									
	NA	15	NA	6.5–8.5	NA	250	300	50	500



**Figure 4.** Water levels in well ST-563 screened in the Slidell aquifer in St. Tammany Parish, Louisiana (see fig. 1 for well location).

## The Jasper Equivalent Aquifer System

The Jasper equivalent aquifer system underlies the Evangeline equivalent aquifer system and in St. Tammany Parish consists of, from shallowest to deepest, the Tchefuncte, Hammond, Amite, and Ramsay aquifers. In 2005 about 19 percent (4.4 Mgal/d) of the groundwater used in St. Tammany

Parish was withdrawn from the Jasper equivalent aquifer system. Most of the water was withdrawn from the Tchefuncte aquifer (1.9 Mgal/d), the Hammond aquifer (2.1 Mgal/d), and the Amite aquifer (0.4 Mgal/d). About 4.4 Mgal/d (almost 100 percent) was withdrawn for public supply use.

The base of the aquifer system ranges from 2,350 ft below NGVD 29 in northern areas of the parish to as deep as



3,300 ft below NGVD 29 near Covington. Aquifers in the Jasper equivalent aquifer system typically consist of 50- to 250-ft-thick units of fine to coarse sand and some pea gravel.

The Jasper equivalent aquifer system contains water-bearing units throughout St. Tammany Parish. Saltwater is present in some of the aquifers in the system at and to the south of Slidell and Lacombe. Aquifers in the system typically yield freshwater that is soft and does not generally exceed the EPA's SMCLs; however, some freshwater may exceed the SMCLs for pH, iron, and manganese (table 3).

About 70 wells are screened in the Jasper equivalent aquifer system and are used for public-supply (36), domestic (23), irrigation (10), or industrial (1) purposes. Reported well yields from wells screened in the aquifer system generally range from about 90 to 1,830 gal/min. In 2006, water levels in the Jasper aquifer system generally ranged from about 100 ft above NGVD 29 in the northern part of the parish to about 70 ft above NGVD in the southern part of the parish.

## Surface-Water Resources

Lake Pontchartrain and the Pearl, West Pearl, Tchefuncte, and Bogue Chitto Rivers are the primary sources of surface water in St. Tammany Parish. In 2005, about 0.06 Mgal/d of surface water was withdrawn in St. Tammany Parish; about

0.04 Mgal/d were used for livestock, and about 0.01 Mgal/d were used for general irrigation. Other surface water resources in the parish include the Abita and Bogue Falaya Rivers. Although Lake Pontchartrain is a huge potential source of water for St. Tammany Parish, water in the lake is brackish to salty and would require treatment for most uses.

The average discharge for the Pearl and West Pearl Rivers at the town of Pearl River was about 9,470 cubic feet per second (ft<sup>3</sup>/s) (6,120 Mgal/d) for the period 1964–70. Water in the Pearl and West Pearl Rivers is generally fresh, but during periods of low flow, saltwater has intruded 2 to 3 mi upstream from Lake Borgne.

The average discharge for the Tchefuncte River near Folsom was about 159 ft<sup>3</sup>/s (103 Mgal/d) for the period 1944–2007. Water in the Tchefuncte River is generally fresh, but during periods of low flow, saltwater has intruded from Lake Pontchartrain upstream to the City of Covington. Water in the Tchefuncte River generally is soft but may be moderately hard (61–120 mg/L as CaCO<sub>3</sub>) and slightly acidic (pH less than 6.5 standard units) (table 4).

The average discharge for the Bogue Chitto River near Bush was about 2,000 ft<sup>3</sup>/s (1,289 Mgal/d) for the period 1938–2007. Analyses of water quality samples from the river indicate that the water is typically soft but may be slightly acidic and exceed the EPA's SMCL for iron (table 4).

**Table 4.** Summary of selected water-quality characteristics for the Tchefuncte and Bogue Chitto Rivers in St. Tammany Parish, Louisiana, 1953–95.

[Values are in milligrams per liter, except as noted. °C, degrees Celsius; µS/cm, microsiemens per centimeter; SU, standard units; µg/L, micrograms per liter; CaCO<sub>3</sub>, calcium carbonate; NA, not applicable; SMCL, Secondary Maximum Contaminant Level established by the U.S. Environmental Protection Agency, 2006]

	Specific conductance, field (µS/cm at 25 °C)	Oxygen, dis- solved	pH, field (SU)	Hardness (as CaCO <sub>3</sub> )	Calcium, filtered (as Ca)	Magnesium, filtered (as Mg)	Sodium, filtered (as Na)	Chloride, filtered (as Cl)	Sulfate, filtered (as SO <sub>4</sub> )	Iron, filtered (µg/L as Fe)
Tchefuncte River below Covington <sup>1</sup>										
Median	512	NA	6.5	38	6.1	2.6	53	126	16	40
10th percentile	57	NA	5.6	8	2	0.3	5.3	5.9	1.8	10
90th percentile	2,102	NA	7	180	20	33	290	609.2	72	92
Number of samples	103	0	61	63	61	61	61	103	61	59
Percentage of samples that meet SMCLs	NA	NA	55	NA	NA	NA	NA	58	100	100
Bogue Chitto River near Bush <sup>2</sup>										
Median	44	8.15	6.4	9	2	0.9	4	6.1	2.1	200
10th percentile	36.9	7	5.9	7	1.6	0.5	2.7	4.2	1	87.6
90th percentile	49	10	6.9	10.2	2.7	1.1	5.1	7.8	4.3	280
Number of samples	180	160	190	189	178	175	176	186	182	78
Percentage of samples that meet SMCLs	NA	NA	45	NA	NA	NA	NA	100	100	94
SMCLs										
	NA	NA	6.5–8.5	NA	NA	NA	NA	250	250	300

<sup>1</sup>Station number 07375224.

<sup>2</sup>Station number 02492000.

## References

- 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., 7 pls.
- 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.
- 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.
- Sargent, B.P., 2007, Water use in Louisiana, 2005: Louisiana Department of Transportation and Development Water Resources Special Report no. 16, 133 p.
- U.S. Environmental Protection Agency, 1992, Secondary drinking water regulations—guidance for nuisance chemicals: U.S. Environmental Protection Agency publication EPA 810/K-92-001, 4 p., accessed July 29, 2009, at <http://www.epa.gov/safewater/consumer/2ndstandards.html>.
- U.S. Environmental Protection Agency, 2006, 2006 Edition of the drinking water standards and health advisories: Washington D.C., U.S. Environmental Protection Agency, Office of Water, 12 p.
- U.S. Geological Survey, 2008a, Ground-water levels for Louisiana: U.S. Geological Survey digital dataset, accessed May 22, 2008, at <http://nwis.waterdata.usgs.gov/la/nwis/gwlevels>.
- U.S. Geological Survey, 2008b, Water-quality samples for Louisiana: U.S. Geological Survey digital dataset, accessed May 22, 2008, at <http://nwis.waterdata.usgs.gov/la/nwis/qwdata>.
- U.S. Geological Survey, 2008c, StreamStats: U.S. Geological Survey digital dataset, accessed July 28, 2008, at <http://streamstats.usgs.gov/gages/viewer.htm>.



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