ANALYSIS OF SELECTED WATER-QUALITY DATA FOR SURFACE WATER IN ST. TAMMANY PARISH, LOUISIANA, APRIL-AUGUST 1995

By Dennis K. Demcheck

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ANALYSIS OF SELECTED WATER-QUALITY DATA FOR SURFACE WATER IN ST. TAMMANY PARISH, LOUISIANA, APRIL-AUGUST 1995

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Abstract

Physical and chemical-related properties, concentrations of chemical constituents, which included major inorganic ions and nutrients, and concentrations of fecal-coliform bacteria were determined for 17 sites on 11 streams in St. Tammany Parish, Louisiana, during the period April-August 1995. The streams were sampled to assess the effects of different streamflow conditions on the concentrations of water-quality constituents. The water-quality properties and constituents selected for analysis include those that generally are indicative of altered organic-material inputs from both point and nonpoint human sources, as well as naturally-occurring sources. The streams included in the study were Tchefuncte River, Bogue Falaya, Abita River, Bayou Chinchouba, Bayou Castine, Cane Bayou, Bayou Lacombe, Bayou Liberty, Bayou Bonfouca, Bogue Chitto, and West Pearl River.

Water-quality samples were collected under several hydrologic conditions. These conditions included a period of wet weather and sustained high river stages; a period of local storms several days apart and river stages typical of that situation; and a period of dry weather and low river stages.

The concentrations of inorganic constituents in streams draining the mixed pine forests generally are lower than in other streams in southern Louisiana. The Abita River, in particular, has very low concentrations of major ions and a low alkalinity that ranged only from 2 to 9 mg/L (milligrams per liter) at Abita Springs and 2 to 31 mg/L at U.S. Highway 190. This indicates that the stream has very little buffering capacity. The upper reach of Bayou Lacombe (1 mile north of Interstate-12) similarly has little buffering capacity. This makes these streams particularly susceptible to adverse effects from accidental spills of strong acids or bases.

Nutrient concentrations varied and indicated that degraded water-quality conditions that typically occur during storms persisted less than 1 to 3 days. In general, the larger the drainage basin, the longer it takes for the stream to recover. The dissolved-nitrate concentrations in water from the Bogue Chitto-West Pearl River system (0.18 - 0.31 mg/L in the Bogue Chitto and 0.05 to 0.27 mg/L in the West Pearl River) could, in combination with the dissolved-phosphorus concentrations (0.02-0.06 mg/L in the Bogue Chitto-West Pearl River system), produce eutrophic conditions that result in algal blooms. The fact that algal blooms are rarely observed in this system indicates that other factors are restricting algal growth.

Fecal-coliform bacteria concentrations were highest in April and August and lowest in June. The water samples collected from the Tchefuncte River near Covington in April had a fecal-coliform concentration of 22,000 cols/100 mL (colonies per 100 milliliters). A sample from the Bogue Chitto near Bush had a concentration of 30,000 cols/100 mL.

Peak fecal-coliform concentrations in water samples collected 2 days after storms in May were lower than those in samples collected after storms in April. The Tchefuncte River near Covington and the Bogue Chitto near Bush had a fecal-coliform concentration of 1,000 cols/100 mL. This corresponds with the biochemical oxygen demand results that indicated much of the organic matter had been flushed out of the basins in April.

Water samples collected in June had much lower fecal-coliform concentrations at all sites. The lack of rainfall might have reduced sewage inputs. The highest concentration recorded in June was 210 cols/100 mL.

Fecal-coliform concentrations in water samples collected in August varied, which reflected the effects of small, isolated storms in the study area. Bayou Castine, sampled immediately after a storm, had a fecal-coliform concentration of 26,000 cols/100 mL. The stream was resampled 24 hours later, and the fecal-coliform concentration had decreased to 1,700 cols/100 mL. This is an indication of the rapid water-quality changes that typically occur in small streams.

INTRODUCTION

St. Tammany Parish has undergone extensive growth in the last decade. In 1995, the population growth rate for St. Tammany Parish was first in the State and fifth in the Nation (Richard Hart, St. Tammany Parish Environmental Services Commission, oral commun., 1995). Both public officials and private citizens in the area are concerned about the effects of increased population (and subsequent changes in land use) on the quality of surface water in the parish; the surface waters include many rivers and bayous and part of Lake Pontchartrain. Historically, these surface waters have assimilated naturally occurring organic wastes that primarily were produced by the decomposition of plant material and animal wastes.

Organic wastes are vital nutrients that consist of various forms of nitrogen and phosphorus, which are the base of the food chain in surface water. However, the capability of a riverine system to assimilate increasing amounts of wastes from point sources (such as sewage treatment facilities) and nonpoint sources (such as urban and agricultural land) can become limited. This is particularly true for the generally slow-flowing rivers and bayous in St. Tammany Parish. Exceeding the wastewater-assimilation capacity could result in the degradation of the quality of water in a stream and render it incapable of meeting its designated uses (Louisiana Department of Environmental Quality, 1994).

The U.S. Geological Survey (USGS), in cooperation with St. Tammany Parish Environmental Services Commission, began a study in 1995 to determine selected water-quality constituents in the major rivers and bayous of St. Tammany Parish that may be affected by changes in land use (urbanization). This information will aid managers in planning and making sound decisions regarding wastewater management.

Purpose and Scope

This report presents the results of a water-quality survey of 11 streams in St. Tammany Parish. Samples were collected from 17 sites during the period April-August 1995. The streams were sampled three to four times during this 4-month period to assess the effects of different streamflow conditions on the concentrations of the water-quality constituents. A review of USGS historical water-quality data was completed to aid in site and constituent selection. The water-quality properties and constituents selected for analysis include those that generally are indicative of altered organic-material inputs from both point and nonpoint human-related sources of contamination, as well as naturally occurring sources. The physical properties and concentrations of constituents reported include major inorganic ions, selected nutrients, and fecal-coliform indicator bacteria. Results of the analyses were used to evaluate the effects of these organic-material inputs on the water quality of the 11 streams.

Description of Study Area

St. Tammany Parish, located in southeastern Louisiana, is a predominantly forested and agricultural area (fig. 1). However, the southern part of the parish is becoming increasingly urbanized. St. Tammany Parish has the largest component of the Louisiana Natural and Scenic Rivers System, with all or part of 11 waterways in the system occurring within the parish. St. Tammany Parish is composed of three ecoregions (Omernik and Gallant, 1987). Most of the parish forms part of the Southeastern Plains ecoregions. The Southeastern Plains consist of low relief, dendritic-drainage, timbered land that primarily is an oak-longleaf pine forest (Kniffen and

Hilliard, 1988). Because of the large number of rare and endangered plant species in the Southeastern Plains ecoregion, St. Tammany Parish has more rare and endangered plant species than any other parish in Louisiana (Richard Martin, The Nature Conservancy of Louisiana, oral commun., 1995).

The southern margin of the parish, bordering Lake Pontchartrain, is part of the Mississippi Alluvial Plain ecoregion. This ecoregion has low relief and slope, with braided channels dominated by bottomland hardwoods and tidally affected streams. This narrow margin, seldom extending more than a few miles from the lake, has fresh-to-intermediate salinity marshes near Madisonville (Chabreck and Linscombe, 1978). The marshes become intermediate-to-brackish in the area from Mandeville to Slidell.

The southeastern corner of the parish is in the Southern Coastal Plain ecoregion. Vegetation consists of bottomland hardwoods, cypress-tupelo gum swamps, low-slope braided streams, and fresh-to-intermediate salinity marshes.

The two major river systems in St. Tammany Parish (fig. 2) are the Bogue Chitto-Pearl River system and the Tchefuncte River-Bogue Falaya-Abita River system. Six bayous (Chinchouba, Castine, Cane, Lacombe, Liberty, and Bonfouca) are tidally affected and flow generally southwestward through areas of the most rapidly expanding population and development.

Previous Studies

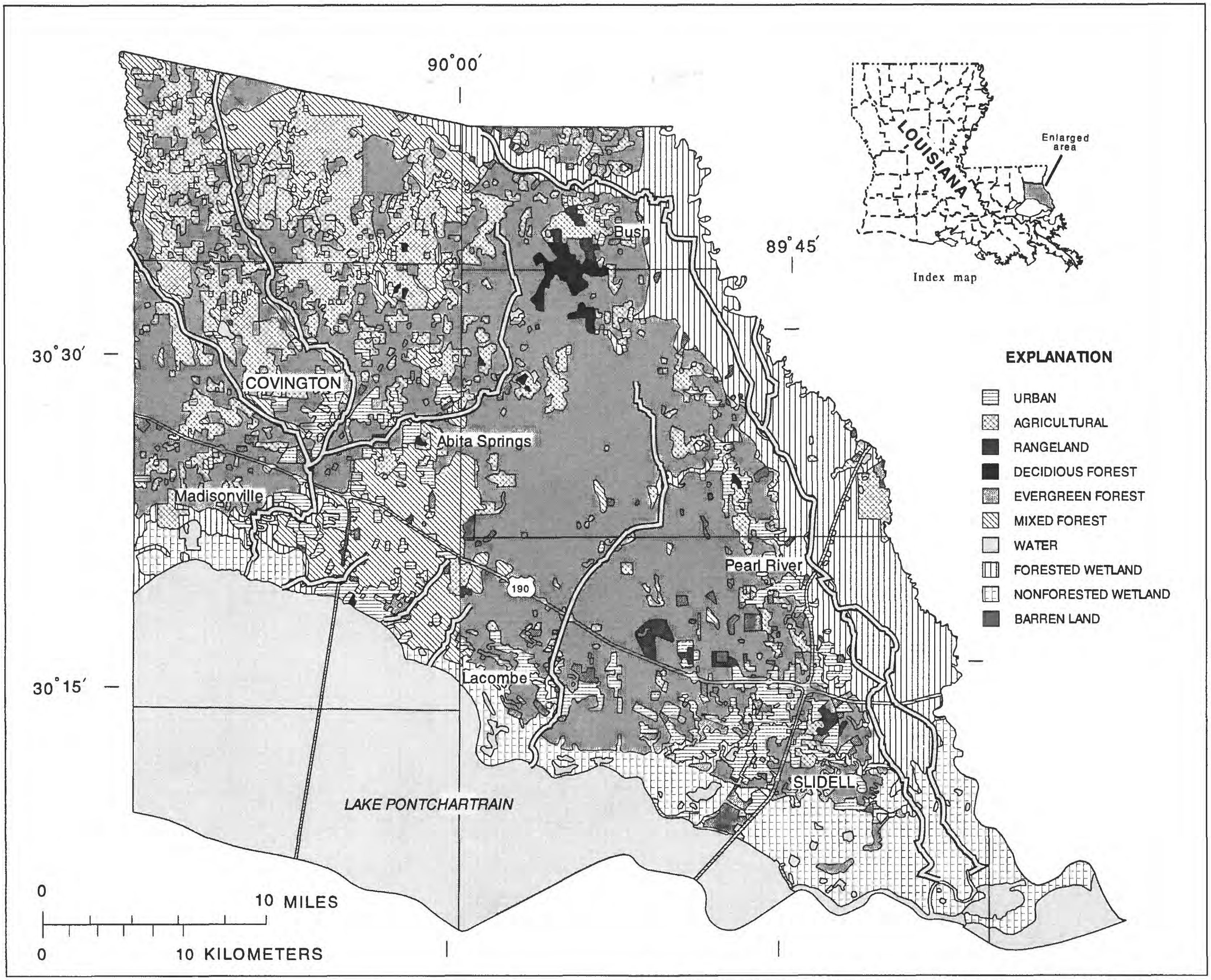
Cardwell and others (1967) discussed the surface- and ground-water resources of the Lake Pontchartrain area. Concerning the surface waters of St. Tammany Parish, the study discussed the Pearl River and Tchefuncte River. The principal findings regarding these rivers were that the water quality generally is good, but during periods of low flow, saltwater can intrude upstream as far as U.S. Highway 90 for the Pearl River, and as far as the city of Covington for the Tchefuncte River.

Two of the waterways, Bayou Chinchouba and the Bogue Chitto, are reported by the Louisiana Department of Environmental Quality (1990) as not supporting their designated uses. Bayou Chinchouba has poor water quality due to sewage discharges and urban runoff. The reasons for slight problems with turbidity and pathogen indicators in the Bogue Chitto are more varied, including minor municipal point sources, inflow and infiltration of wastes from dairy and cattle pastureland, forest management, surface mining, and upstream sources. Parts of the Tchefuncte River and Bogue Falaya are reported as partially supporting their designated uses, as a result of contamination from point and nonpoint sewage sources.

An advisory against fish consumption and swimming was issued for Bayou Bonfouca because of the contamination of bottom sediments by surface runoff from an abandoned creosote facility. Primary contact recreation advisories are in effect for the Tchefuncte and Bogue Falaya Rivers, because of contamination by septic tank and animal waste runoff (Louisiana Department of Environmental Quality, 1994).

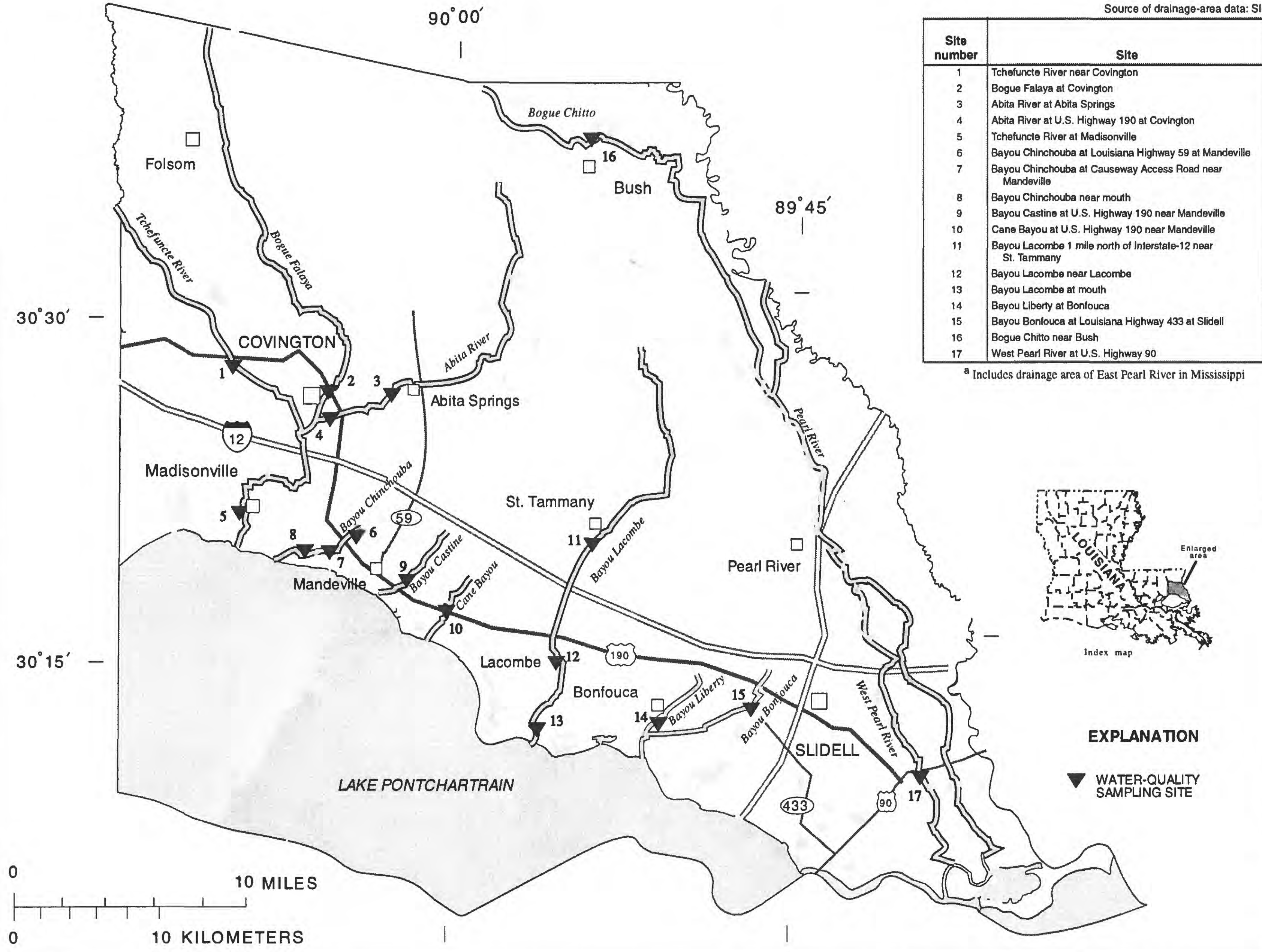
Data Collection

Based on the results of the analysis of USGS historical data and discussions with St. Tammany Parish officials, 17 sites on 11 streams were selected for water-quality sampling (fig. 2). Two of the sites, Bogue Chitto near Bush and West Pearl River at U.S. Highway 90, reflect the water quality of areas outside the most rapidly developing areas of the parish. The results of those analyses were used for an appraisal of the general water quality in southeastern Louisiana.



Modified from U.S. Geological Survey digital data, 1:100,000 and 1:250,000, 1990

Figure 1. Major land uses in St. Tammany Parish, Louisiana.



Source of drainage-area data: Sloss, 1971

Site number	Site	Drainage area, in square miles
1	Tchefuncte River near Covington	145
2	Bogue Falaya at Covington	191
3	Abita River at Abita Springs	46
4	Abita River at U.S. Highway 190 at Covington	59
5	Tchefuncte River at Madisonville	450
6	Bayou Chinchouba at Louisiana Highway 59 at Mandeville	10
7	Bayou Chinchouba at Causeway Access Road near Mandeville	11
8	Bayou Chinchouba near mouth	11
9	Bayou Castine at U.S. Highway 190 near Mandeville	8
10	Cane Bayou at U.S. Highway 190 near Mandeville	9
11	Bayou Lacombe 1 mile north of Interstate-12 near St. Tammany	69
12	Bayou Lacombe near Lacombe	78
13	Bayou Lacombe at mouth	96
14	Bayou Liberty at Bonfouca	36
15	Bayou Bonfouca at Louisiana Highway 433 at Slidell	33
16	Bogue Chitto near Bush	1,210
17	West Pearl River at U.S. Highway 90	[a]8,500

[a] Includes drainage area of East Pearl River in Mississippi

Figure 2. Location of surface-water-quality sampling sites, St. Tammany Parish, Louisiana, April-August 1995.

Depth-integrated water-quality samples for inorganic constituents and nutrients were collected from water less than 20 feet deep and having velocities less than 1.5 ft/s (feet per second), using an epoxy-coated wire-basket sampler containing a narrow-mouth 1-liter glass bottle that had been cleaned and fired at 350 °C (degrees Celsius) for 6 hours to burn off any organic contaminants. All water samples were preserved and, when required, filtered according to standard USGS methods (Fishman and Friedman, 1989; Britton and Greeson, 1988). All nutrient and inorganic-constituent samples were stored in coolers at 4 °C immediately upon collection, placed in refrigerators after processing, and shipped in coolers at 4 °C to a USGS laboratory for analysis.

Samples for analysis of coliform bacteria were collected in sterilized glass bottles and processed within 4 hours of collection. The samples were analyzed using the membrane-filter method described by Britton and Greeson (1988).

Quality Assurance

Water-quality sampling equipment for field measurements was calibrated before and after each use. The analyses were performed at USGS laboratories using procedures approved by the U.S. Environmental Protection Agency (USEPA). Ten percent of all samples were analyzed in duplicate. All analyses were checked and verified by USGS personnel.

Acknowledgments

The author expresses appreciation to Richard Hart, Director, and Aundrea Kloor of St. Tammany Parish Environmental Services Commission, for their assistance provided during the design and preparation of this report.

ANALYSIS OF SELECTED SURFACE-WATER-QUALITY DATA

At the inception of the study, a review of USGS historical water-quality data was undertaken to assist in site selection and data interpretation. The USGS has collected surface-water-quality information from 56 sites in St. Tammany Parish, 6 of which have at least 10 records, considered to be the minimum number sufficient for statistical summary. Those sites and the periods of record are listed below:

Site	Period of record
Tchefuncte River near Covington	Oct. 1958-July 1993
Tchefuncte River near Folsom	Oct. 1943-July 1980
Bogue Chitto near Bush	Sept. 1953-Sept. 1992
Pearl River at Pearl River	Oct. 1963-Sept. 1964
Lake Pontchartrain at mouth of Bayou Lacombe	June 1974-Jan. 1981
Lake Pontchartrain at north shore	Apr. 1974-July 1984

The water-quality data (appendix A) and information related to point-source discharge points and land use published by Louisiana Department of Environmental Quality (1994) indicated that the major known water-quality problems in the parish are caused by point and nonpoint nutrient and animal-wastes inputs, especially in the upper reaches of the streams. Most of the historical data consist of inorganic-constituent, nutrient, and fecal-bacteria concentrations. Two of the sites, Bogue Chitto near Bush, and Tchefuncte River near Covington, also have trace-element data. The data at the two sites indicated no trace-element problems. Unfortunately, little information exists on pesticides and other synthetic organic compounds in St. Tammany Parish.

Hydrologic Conditions During Data Collection

The small number of water-quality samples collected during the study and the time period allotted for sample collection necessitated sample collection on a hydrologic-event basis. The events chosen were a period of wet weather and sustained high river stages; a period that included local storms several days apart and river stages typical for the season; and a period of dry weather and low river stages. Sampling during these three major weather categories lessened many of the biases associated with a limited number of samples. For example, sampling only during dry weather may increase the relative importance of isolated inputs, sampling during a storm may reflect high but transient concentrations during the initial runoff (the first-flush effect), and sampling during prolonged wet weather often produces low concentrations because of dilution.

A series of intense storms produced extensive flooding during the spring of 1995. Intense storms moved through St. Tammany Parish on March 7, April 10, and May 8-10. The April 10 storm produced 5-7 inches of rainfall in a 24-hour period and caused widespread flooding in the towns of Covington and Slidell. Samples representing this hydrologic condition were collected April 12-13. At sites 1-4, 11, and 12 the streams were out-of-bank with a decreasing stage; at all the other sites streams were bank-full. On May 9-10, Slidell recorded 15.75 inches of rainfall in 24 hours, which caused widespread flooding. Because of the high rainfall and flooding, additional wet-weather samples were collected on May 12. Stream stages at sites 1, 3, 4, 6, 7, 9, 11, 12, and 13 were out-of-bank and decreasing; the others were bank-full.

Stream stages were low and stable during the June 7-9 dry-weather sampling, a result of little or no rainfall the previous 2 weeks. A slight (less than 0.2 ft/s), tidally influenced upstream velocity was noted at Bayou Liberty (site 14).

Scattered thunderstorms throughout southeastern Louisiana in mid-to-late July produced elevated stages of short duration typical of the season. August 1-2 was chosen for sampling because of the lack of extreme hydrologic conditions which characterized the earlier samples. Bayous in small basins, such as Bayou Castine (site 9) and Bayou Chinchouba (sites 6 and 8), were out-of-bank as a result of isolated thunderstorms on July 31. Bayou Lacombe at sites 12 and 13 was out-of-bank due to strong easterly winds July 31 forcing Lake Pontchartrain water into Bayou Lacombe.

Physical and Chemical-Related Properties

Physical and chemical-related properties determined for 17 sites along the streams in St. Tammany Parish, during April-August 1995, are presented in table 1. Properties include specific conductance, pH, water temperature, dissolved oxygen (DO), and the 5-day biochemical oxygen demand (BOD). BOD concentrations also are shown graphically in appendix B. Values of these properties varied among streams, reflecting different land-use categories (fig. 1). For example,

Table 1. Physical and chemical-related properties determined for selected surface-water sites in St. Tammany Parish, Louisiana, April-August 1995

[See figure 2 for site location. --, no data]

Date	Specific conductance, in µS/cm at 25 degrees Celsius	pH, water, in standard units	Temperature, water, in degrees Celsius	Oxygen, dissolved, in milligrams per liter	Oxygen demand, biochemical, 5 day, in milligrams per liter	Solids, residue at 180 degrees Celsius, dissolved, in milligrams per liter
Tchefuncte River near Covington, site 1						
Apr. 12	16	5.2	18.5	7.2	3.0	16
May 12	24	5.5	22.5	6.2	1.7	--
June 7	35	5.9	23.5	6.9	.6	46
Aug. 2	39	5.9	25.5	6.7	.6	42
Bogue Falaya at Covington, site 2						
Apr. 12	17	5.2	18.5	7.2	2.8	--
May 12	24	5.6	22.0	6.7	1.3	--
June 7	36	5.9	24.5	7.5	.6	38
Aug. 2	47	6.1	25.5	6.7	.7	36
Abita River at Abita Springs, site 3						
Apr. 12	16	4.7	19.0	6.2	1.7	32
May 12	14	4.5	23.5	4.8	1.6	--
June 7	33	5.6	26.0	6.4	1.3	62
Aug. 2	46	5.8	26.0	6.5	.7	60
Abita River at U.S. Highway 190 at Covington, site 4						
Apr. 12	16	4.9	19.0	6.5	2.9	32
June 7	43	5.8	25.5	2.2	1.3	58
Aug. 2	112	6.2	26.0	1.4	3.0	88
Tchefuncte River at Madisonville, site 5						
Apr. 12	24	5.7	19.5	6.2	3.4	26
May 12	18	5.5	23.0	5.4	1.7	--
June 7	66	6.2	30.0	9.2	4.3	54
Aug. 2	144	6.2	29.5	6.0	1.9	94
Bayou Chinchouba at Louisiana Highway 59 at Mandeville, site 6						
Apr. 13	28	4.9	17.5	4.6	1.7	60
Bayou Chinchouba at Causeway Access Road near Mandeville, site 7						
Apr. 13	41	5.8	19.0	5.3	3.1	44
May 12	26	5.7	22.5	5.0	2.1	--
Aug. 2	155	6.4	28.5	2.7	2.3	118
Bayou Chinchouba near mouth, site 8						
Aug. 2	--	7.2	30.5	6.2	2.7	124
Bayou Castine at U.S. Highway 190 near Mandeville, site 9						
Apr. 13	41	5.7	18.0	3.7	4.6	62
May 12	13	4.9	23.5	4.8	1.7	--
June 8	56	5.7	27.5	1.2	3.0	72
Aug. 1	90	5.9	26.5	2.0	7.1	86
Cane Bayou at U.S. Highway 190 near Mandeville, site 10						
Apr. 13	24	4.8	19.0	5.7	2.1	44

Table 1. Physical and chemical-related properties determined for selected surface-water sites in St. Tammany Parish, Louisiana, April-August 1995—Continued

Date	Specific conductance, in µS/cm at 25 degrees Celsius	pH, water, in standard units	Temperature, water, in degrees Celsius	Oxygen, dissolved, in milligrams per liter	Oxygen demand, biochemical, 5 day, in milligrams per liter	Solids, residue at 180 degrees Celsius, dissolved, in milligrams per liter
Cane Bayou at U.S. Highway 190 near Mandeville, site 10—Continued						
May 12	21	4.5	23.0	5.0	1.2	--
June 8	182	6.1	30.5	7.2	4.6	134
Aug. 2	653	6.4	27.5	0.9	4.7	378
Bayou Lacombe 1 mile north of Interstate-12 near St. Tammany, site 11						
Apr. 13	18	4.3	19.0	6.2	1.3	28
June 8	37	5.4	24.5	7.6	1.5	50
Aug. 2	41	5.0	27.5	7.9	.8	62
Bayou Lacombe near Lacombe, site 12						
Apr. 13	17	4.6	20.5	6.0	1.4	28
May 12	13	4.7	24.0	4.8	.9	--
June 8	103	6.1	30.5	7.1	3.4	80
Aug. 2	506	5.8	28.0	1.7	2.4	300
Bayou Lacombe at mouth, site 13						
Apr. 13	261	5.7	20.5	5.4	1.7	154
June 8	1,030	6.1	28.0	4.6	2.6	602
Aug. 2	7,260	6.3	29.0	4.4	1.0	1,440
Bayou Liberty at Bonfouca, site 14						
Apr. 13	28	5.4	21.0	5.2	2.0	50
May 12	16	5.0	23.5	4.4	1.2	--
June 9	768	7.0	32.5	8.2	3.3	396
Aug. 1	2,620	6.6	29.0	3.6	2.3	1,510
Bayou Bonfouca at Louisiana Highway 433 at Slidell, site 15						
Apr. 13	80	7.2	20.5	5.0	4.1	66
May 12	33	6.0	23.5	4.3	1.6	--
June 9	242	7.6	30.5	4.4	2.5	146
Aug. 1	3,000	6.9	28.5	4.0	1.1	--
Bogue Chitto near Bush, site 16						
Apr. 12	22	5.7	19.0	7.1	3.0	22
May 12	32	5.8	23.5	6.3	1.5	--
June 8	40	6.1	27.0	7.0	1.5	38
Aug. 1	45	6.4	27.0	7.2	.5	34
West Pearl River at U.S. Highway 90, site 17						
Apr. 13	46	6.2	20.5	6.6	1.9	38
June 9	56	6.2	28.0	5.3	1.3	54
Aug. 1	115	6.2	28.0	4.4	1.5	78

water in the Abita River, which drains mixed pine forests, is characterized by low pH and low specific conductance. During the April and May sampling, the pH of the Abita River at Abita Springs (site 3) was 4.7 and 4.5. This is more acidic than is typical for most streams in southern Louisiana, and reflects the naturally acidic conditions characteristic of extensive pine forests. The upper reach of Bayou Lacombe also drains this mixed pine area, and exhibits a similar low-pH pattern (4.3 at site 11 in April). Also, rainwater is naturally acidic. Rainfall composition is highly variable, not only from place to place, but also from storm to storm, with pH values from 6.4 to 4.9 considered representative (Hem, 1985, p. 36).

Specific conductance is a measure of the ability of water to conduct an electric current, and is an estimate of the total amount of dissolved constituents. The specific conductances measured in streams draining sandy mixed-pine forests, particularly the Abita River (site 3), along with the upper reaches of the Tchefuncte River (site 1), Bogue Falaya (site 2), and Bayou Lacombe (site 11) were low, indicating the very dilute nature of the upper reaches of these streams. Specific conductances at site 3 on the Abita River, for example, ranged from 14 to 46 μS/cm (microsiemens per centimeter at 25 °C), and at sites 1, 2, and 11 from 16 to 47 μS/cm. In contrast, specific conductances at small bayous such as Cane, Castine, Chinchouba, and Liberty ranged from 13 to 2,620 μS/cm. This reflects the fact that these streams are tidally affected, with brackish water intruding upstream from Lake Pontchartrain. These small bayous also drain wetlands and urban areas, producing a wider range of specific conductances than those streams draining predominantly mixed pine forests. Bayou Lacombe is a mixture of all these land uses, draining pine forests at the upper reach (site 11), developed areas (site 12) in the mid-reach, and tidally affected wetlands (site 13) near the mouth. Therefore, the range in specific conductances in Bayou Lacombe during the study was the largest, from 13 to 7,260 μS/cm.

DO concentrations during the study generally were at or above the minimum concentrations considered necessary by Louisiana Department of Environmental Quality (1990) for freshwater fish populations (5.0 mg/L, milligrams per liter) and estuarine fish populations (4.0 mg/L). The major exceptions are at or near the downstream reaches of small streams such as the Abita River (site 4) and Bayou Chinchouba (site 7), Bayou Castine (site 9), Cane Bayou (site 10), and Bayou Lacombe (site 12). In August, high water temperatures and little or no downstream flow caused typically low DO concentrations such as 1.4 mg/L at site 4; 2.7 mg/L at site 7; 2.0 at site 9; 0.9 mg/L at site 10; and 1.7 mg/L at site 12. During the June sampling, DO concentrations indicated that two sites, Tchefuncte River at Madisonville (site 5) and Bayou Liberty at Bonfouca (site 14), were supersaturated with oxygen. Site 5 had 122 percent and site 14 had 114 percent of the maximum oxygen concentration expected at that temperature and barometric pressure. This indicates a high level of photosynthetic activity by phytoplankton that is releasing oxygen into the water faster than it can diffuse. However, this does not indicate a severe algal bloom problem, as percent saturations during bloom conditions often exceed 200-400 percent (C. Fred Bryan, National Biological Service, oral commun., 1995). Additional indication that this was not a severe bloom problem is that the pH values (6.6 at site 5 and 7.0 at site 14) are typically higher during a bloom, with values of 7.8-8.8 occurring as phytoplankton remove carbon dioxide from the water during the day (Goldman and Horne, 1983, p. 98). Carbon dioxide acts as a weak acid, and its removal raises the pH.

BOD is a measurement that estimates the total amount of organic matter in a water sample that can be assimilated by aerobic bacteria. An initial DO concentration is determined, the sample is then incubated at 20 °C for 5 days, and a second DO measurement is recorded. The difference between the two DO concentrations is the BOD.

The results from the 5-day BOD analysis (table 1) appear to be related primarily to basin size and the time since the last major rainfall, rather than to the degree of urbanization. For the purposes of this report, a major rainfall is defined as one that causes a stream to rise out-of-channel. During the study this occurred on a widespread basis only on April 10-12 and May 9-10. On July 31, isolated thunderstorms caused Bayou Castine to briefly flood. For example, the BOD concentrations were lower in samples collected in May than in those collected in April, probably because the April rains had flushed considerable organic material out of the basins. It should be emphasized that the peak BOD concentrations were probably higher than those measured, as the samples were collected 1-3 days after the initial rainfall. However, the results indicate that the flushing action in these basins is relatively brief. The duration and magnitude of the peak BOD concentrations are not known, as this requires many samples collected immediately after the inception of rainfall, preferably at hourly intervals throughout the storm and the accompanying rise and fall of the stream. However, it is generally recognized through the efforts of Weibel and others (1964) and the U.S. Environmental Protection Agency National Urban Runoff Program during the 1980's, that elevated concentrations of contaminants are found in the highest concentrations in the initial hours of a storm (the first flush). A high BOD (7.1 mg/L) in Bayou Castine on August 1 was a result of sampling immediately after a storm that occurred the night of July 31. In this instance, the samples probably indicate the degraded water-quality conditions prevalent during and immediately after a storm. Isolated peaks in BOD concentrations in June, such as 4.3 mg/L measured at site 5 and 3.3 mg/L at site 14, reflect populations of phytoplankton at these downstream sites.

Inorganic Chemical Constituents

Concentrations of inorganic chemical constituents in water samples collected from the study sites are presented in table 2. The concentrations of constituents in streams draining the mixed pine forests, particularly 1,2,3, and 11, generally are lower than in other southern Louisiana streams. The Abita River, in particular, has very low concentrations of major ions and a low alkalinity; alkalinity ranged only from 2 to 9 mg/L at site 3 and from 2 to 31 mg/L at site 4. This indicates that the stream has very little buffering capacity. A solution is said to be buffered if its pH is not greatly altered by the addition of moderate quantities of acid or base (Hem, 1985). The upper reach of Bayou Lacombe (site 11), similarly, has little buffering capacity. This makes these streams particularly susceptible to adverse effects from accidental spills of strong acids or bases.

The inorganic constituent data indicate that the upstream sites are similar in major-ion concentrations and are predominantly sodium chloride (salt) and calcium carbonate- bicarbonate waters. The downstream sites and tidally affected streams have a much stronger sodium chloride component that becomes more predominant, as indicated by the June and August data. These differences in inorganic composition are merely the differences between freshwater and saltwater and do not indicate human-induced water-quality degradation.

Nutrients

Nutrients, as referred to in this report, are defined as the various oxidized and reduced forms of nitrogen and phosphorus. Dissolved nitrate is the form most readily utilized for plant growth (Hem, 1985, p. 124). In low concentrations, nutrients form the base of all aquatic food webs. However, excessive nutrients can cause algal blooms, depressed DO concentrations with resulting fish kills, and a decreased capability of a water body to support diverse forms of aquatic life. In

Table 2. Concentrations of inorganic chemical constituents determined for selected surface-water sites in St. Tammany Parish, Louisiana, April-August 1995

[See figure 2 for site location. <, less than]

Date	Calcium, dissolved, in milligrams per liter as Ca	Magnesium, dissolved, in milligrams per liter as Mg	Sodium, dissolved, in milligrams per liter as Na	Potassium, dissolved, in milligrams per liter as K	Alkalinity, in milligrams per liter as $CaCO_3$	Sulfate, dissolved, in milligrams per liter as SO_4	Chloride, dissolved, in milligrams per liter as Cl	Silica, dissolved, in milligrams per liter as SiO_2
Tchefuncte River near Covington, site 1								
Apr. 12	0.72	0.36	1.0	1.4	3	1.2	1.4	1.8
June 7	1.6	.92	3.0	1.4	9	1.5	3.9	9.7
Aug. 2	1.9	.75	3.2	.98	9	1.3	3.7	10
Bogue Falaya at Covington, site 2								
Apr. 12	.81	.38	1.2	1.1	4	1.4	1.5	2.2
June 7	1.7	.74	4.2	.78	10	1.5	4.2	10
Aug. 2	2.0	.68	4.9	.81	11	1.8	4.7	12
Abita River at Abita Springs, site 3								
Apr. 12	.80	.26	1.3	.52	2	1.1	1.4	1.9
June 7	.86	.40	5.6	.50	7	1.9	3.6	9.6
Aug. 2	1.5	.54	6.2	.74	9	3.1	4.2	10
Abita River at U.S. Highway 190 at Covington, site 4								
Apr. 12	.74	.26	1.3	.50	2	1.1	1.4	1.8
June 7	1.3	.52	6.3	.64	9	2.7	4.0	9.0
Aug. 2	2.9	.72	14	1.8	31	5.8	7.2	14
Tchefuncte River at Madisonville, site 5								
Apr. 12	1.2	.50	2.0	.99	5	1.5	2.2	2.0
June 7	1.6	1.2	6.8	1.6	8	2.7	9.2	4.5
Aug. 2	2.9	2.5	18	1.8	18	6.6	27	3.6
Bayou Chinchouba at Louisiana Highway 59 at Mandeville, site 6								
Apr. 13	1.2	.41	3.3	.44	2	1.2	3.0	2.4
Bayou Chinchouba at Causeway Access Road near Mandeville, site 7								
Apr. 13	2.4	.56	4.5	.69	9	2.1	3.4	3.0
Aug. 2	6.2	1.1	22	2.1	56	6.3	7.7	9.0
Bayou Chinchouba near mouth, site 8								
Aug. 2	6.2	1.7	24	2.3	50	7.6	15	8.1
Bayou Castine at U.S. Highway 190 near Mandeville, site 9								
Apr. 13	3.0	.80	4.4	.91	12	1.7	3.2	3.2
June 8	2.3	.80	10	.47	16	1.5	5.3	4.3
Aug. 1	6.2	1.4	10	2.9	25	5.2	8.2	5.4
Cane Bayou at U.S. Highway 190 near Mandeville, site 10								
Apr. 13	.99	.39	2.2	.24	2	.92	2.4	2.3
June 8	3.0	3.2	31	1.0	11	7.5	50	3.3
Aug. 2	10	8.9	100	4.7	50	27	160	5.4

Table 2. Concentrations of inorganic chemical constituents determined for selected surface-water sites in St. Tammany Parish, Louisiana, April-August 1995—Continued

Date	Calcium, dissolved, in milligrams per liter as Ca	Magnesium, dissolved, in milligrams per liter as Mg	Sodium, dissolved, in milligrams per liter as Na	Potassium, dissolved, in milligrams per liter as K	Alkalinity, in milligrams per liter as $CaCO_3$	Sulfate, dissolved, in milligrams per liter as SO_4	Chloride, dissolved, in milligrams per liter as Cl	Silica, dissolved, in milligrams per liter as SiO_2
Bayou Lacombe 1 mile north of Interstate-12 near St. Tammany, site 11								
Apr. 13	0.49	0.22	1.1	0.28	<1	0.83	1.2	1.6
June 8	1.4	.72	3.9	.39	4	5.7	4.2	9.8
Aug. 2	1.6	.64	3.6	.47	3	4.8	4.6	9.3
Bayou Lacombe near Lacombe, site 12								
Apr. 13	.64	.27	1.4	.30	1	.90	1.4	1.6
June 8	2.1	1.4	15	.67	8	5.9	20	4.9
Aug. 2	5.7	6.8	75	2.7	14	21	120	4.4
Bayou Lacombe at mouth, site 13								
Apr. 13	2.6	4.1	33	1.4	6	8.4	61	1.9
June 8	7.4	20	160	6.8	11	39	300	2.8
Aug. 2	16	46	410	16	9	100	730	3.0
Bayou Liberty at Bonfouca, site 14								
Apr. 13	1.5	.56	3.4	.42	5	1.4	3.6	2.0
June 9	6.4	12	120	4.4	23	29	190	3.0
Aug. 1	22	48	430	18	51	110	750	4.6
Bayou Bonfouca at Louisiana Highway 433 at Slidell, site 15								
Apr. 13	9.5	1.1	4.1	.50	30	3.8	2.5	2.1
June 9	20	2.7	24	1.4	66	16	19	4.3
Aug. 1	51	110	960	37	45	240	1,700	6.6
Bogue Chitto near Bush, site 16								
Apr. 12	1.1	.46	2.0	1.5	5	1.3	2.2	3.3
June 8	1.8	.92	3.4	1.4	10	1.5	4.5	11
Aug. 1	1.9	.84	3.7	1.3	9	1.1	5.5	8.7
West Pearl River at U.S. Highway 90, site 17								
Apr. 13	2.4	.80	4.6	1.2	11	3.8	3.2	4.3
June 9	2.7	.88	5.6	2.0	13	5.9	3.9	6.2
Aug. 1	4.4	1.4	13	2.6	25	11	9.3	6.9

general, the USEPA has not recommended restrictive criteria on nitrogen-containing nutrients, based on the fact that concentrations of nitrate or other nutrients that would exhibit toxic effects on fish or wildlife would rarely occur in nature. The maximum contaminant level for total nitrate (as nitrogen) in domestic water supplies is 10 mg/L (U.S. Environmental Protection Agency, 1986). To control accelerated algal growth, the U.S. Environmental Protection Agency (1986) recommends that total phosphorus (P) should not exceed 0.05 mg/L in any stream at the point where it enters any lake, nor 0.025 mg/L within the lake. A desired goal for the prevention of plant nuisances in streams or other flowing waters is 0.1 mg/L total P.

Concentrations of nutrients in water samples collected from the study sites in the parish are presented in table 3; selected nutrients also are shown graphically in appendix B. The sites in the Bogue Chitto (site 16) and West Pearl River (site 17) were chosen to represent water-quality effects unrelated to urbanization within the parish. These sites generally had higher dissolved-nitrate concentrations (0.18-0.31 mg/L at site 16 and 0.05-0.27 mg/L at site 17) than sites 1-15. Nitrate is the most oxidized form of nitrogen, and apparently the consistently higher DO concentrations in these large streams enabled nitrifying bacteria to process nutrient inputs into this inorganic form. The fact that dissolved ammonia, a reduced form of nitrogen, is consistently low at these two sites (0.01-0.07 mg/L) supports this conclusion. The nitrates in the Bogue Chitto-West Pearl River system could, in combination with the phosphorus concentrations (0.02-0.06 mg/L dissolved phosphorus), produce eutrophic conditions that result in algal blooms. The fact that algal blooms are rarely observed in this system indicates that other factors are restricting algal growth. One likely factor is reduced light penetration, due to the turbidity of the water, inhibiting algal growth and reproduction. The nitrate and phosphorus concentrations did not fluctuate as much as in the smaller streams. Apparently, the much larger basin size integrated nutrient inputs, as the relatively slower rises and falls in the river stages produced less extreme nutrient concentrations.

A different nutrient pattern was apparent in the smaller streams. The storms in April and May produced rapid rises and falls in stage. Water-quality samples collected 1-3 days after the heaviest rainfall indicated low nutrient concentrations at streams such as Bayou Castine, Cane Bayou, and Bayou Lacombe. Nutrients available for transport from these small basins had already moved through the system (the first-flush effect) before samples were collected. Samples collected from the Tchefuncte River near Covington (site 1) had relatively high nitrate and phosphorus concentrations for a small drainage area, indicating that the first flush at that site probably consisted of, though briefly, much higher concentrations.

The smaller streams, particularly Bayou Chinchouba (sites 6-8), Bayou Castine (site 9), Cane Bayou (site 10), and the downstream part of the Abita River (site 4) exhibited a different proportion of nutrient forms. The slow-flowing nature of some of the smaller streams often produced stagnant areas that resulted in persistent low DO concentrations. This resulted in an increase in ammonia from decomposition of proteins and then a low amount of nitrification (Goldman and Horne, 1983, p. 122). This is supported by the fact that the reduced form of nitrogen, ammonia, is found in the highest concentrations in small streams at the time of year when the concentrations of DO are lowest, such as the Abita River near the mouth (0.82 mg/L at site 4), Bayou Chinchouba (0.74 mg/L at site 7), and Bayou Bonfouca (0.22 mg/L at site 15).

Organic nitrogen concentrations generally are higher in the smaller streams, accompanied by lower nitrate concentrations. Bayou Castine and Cane Bayou had concentrations of dissolved organic nitrogen that ranged from 0.33 to 0.77 mg/L at site 9, and 0.43 to 0.68 mg/L at site 10. This probably reflects the conversion of nitrates into phytoplankton biomass and their waste products.

The sites on Bayou Lacombe (sites 11-13) had very similar nutrient proportions of low nitrates, low ammonia, and low dissolved organic nitrogen. This probably reflects a system in equilibrium, as nutrients remain relatively stable during different streamflow conditions. Apparently, nutrient assimilation generally is matching nutrients inputs.

Table 3. Nutrients and bacteria concentrations determined for selected surface-water sites in St. Tammany Parish, Louisiana, April-August 1995

[See figure 2 for site location. mg/L, milligrams per liter; cols/100 mL, colonies per 100 milliliters; <, less than; K, non-ideal count; --, no data]

Date	Nitrogen, ammonia, total, in mg/L as N	Nitrogen, ammonia, dissolved, in mg/L as N	Nitrogen, organic, total, in mg/L as N	Nitrogen, organic, dissolved, in mg/L as N	Nitrogen, nitrite, total, in mg/L as N	Nitrogen, nitrite, dissolved, in mg/L as N	Nitrogen, nitrate, total, in mg/L as N	Nitrogen, nitrate, dissolved, in mg/L as N	Phos-phorus, total, in mg/L as P	Phos-phorus, dissolved, in mg/L as P	Coliform bacteria, fecal, in cols/100 mL	Strepto-cocci bacteria, fecal, in cols/100 mL
Tchefuncte River near Covington, site 1												
Apr. 12	--	0.03	--	0.31	--	<0.01	--	0.10	--	0.03	22,000	9,100
May 12	0.09	.09	0.62	.49	0.01	.01	0.13	.13	0.11	.11	1,000	--
June 7	.04	.04	.26	<.20	.01	<.01	.30	.30	.08	.04	160	440
Aug. 2	.03	.03	.43	.32	.01	.01	.18	.18	.04	.02	310	520
Bogue Falaya at Covington, site 2												
Apr. 12	--	.02	--	.30	--	<.01	--	<.02	--	.04	7,400	4,700
May 12	.04	.04	.45	.36	.01	.01	.04	.04	.06	<.02	520	--
June 7	.03	.02	.24	<.20	<.01	<.01	.10	.10	.02	<.02	140	520
Aug. 2	.02	.02	.24	<.20	.01	.01	.04	.04	.04	.04	1,400	540
Abita River at Abita Springs, site 3												
Apr. 12	--	.02	--	.37	--	<.01	--	<.02	--	.03	3,000	2,200
May 12	--	.02	--	.32	--	.01	--	<.02	--	.04	K120	--
June 7	.05	.04	.67	.44	.01	.01	.04	.04	<.02	<.02	K90	K130
Aug. 2	.02	.02	.65	.45	.01	.01	.03	.02	.09	.02	390	730
Abita River at U.S. Highway 190 at Covington, site 4												
Apr. 12	--	.02	--	.30	--	<.01	--	<.02	--	<.02	K4,000	2,500
June 7	.23	.21	.66	.43	.02	.01	.15	.15	.11	.05	K120	K440
Aug. 2	.89	.82	1.0	.48	.05	.04	.24	.24	.39	.24	220	K190
Tchefuncte River at Madisonville, site 5												
Apr. 12	--	.04	--	.30	--	<.01	--	.06	--	<.02	7,600	3,400
May 12	.06	.05	.49	.37	.01	.01	.04	.04	.04	.04	1,100	--
June 7	.04	.02	.69	.37	.01	<.01	.08	.08	.09	.02	K20	K100
Aug. 2	.07	.07	.72	.33	.01	.01	.02	.02	.06	.06	K94	K15
Bayou Chinchouba at Louisiana Highway 59 at Mandeville, site 6												
Apr. 13	--	.02	--	.60	--	.01	--	<.02	--	<.02	300	75

Table 3. Nutrients and bacteria concentrations determined for selected surface-water sites in St. Tammany Parish, Louisiana, April-August 1995 —Continued

Date	Nitrogen, ammonia, total, in mg/L as N	Nitrogen, ammonia, dissolved, in mg/L as N	Nitrogen, organic, total, in mg/L as N	Nitrogen, organic, dissolved, in mg/L as N	Nitrogen, nitrite, total, in mg/L as N	Nitrogen, nitrite, dissolved, in mg/L as N	Nitrogen, nitrate, total, in mg/L as N	Nitrogen, nitrate, dissolved, in mg/L as N	Phos-phorus, total, in mg/L as P	Phos-phorus, dissolved, in mg/L as P	Coliform bacteria, fecal, in cols/100 mL	Strepto-cocci bacteria, fecal, in cols/100 mL
Bayou Chinchouba at Causeway Access Road near Mandeville, site 7												
Apr. 13	--	0.25	--	0.48	--	0.01	--	0.06	--	0.05	920	K710
May 12	0.14	.11	0.64	.41	0.02	.01	0.08	.08	0.08	.07	5,200	--
Aug. 2	.77	.74	1.0	.56	.04	.04	.05	.05	.30	.22	1,100	510
Bayou Chinchouba near mouth, site 8												
Aug. 2	.55	.54	.85	.56	.02	.02	.03	.03	.28	.23	K100	K280
Bayou Castine at U.S. Highway 190 near Mandeville, site 9												
Apr. 13	--	.18	--	.74	--	.01	--	<.02	--	.10	K300	K560
May 12	--	.08	--	.33	--	.01	--	<.02	--	.03	300	--
June 8	.16	.15	.84	.53	.01	.01	.06	.06	.12	.03	100	250
Aug. 1	.05	.04	1.2	.77	.01	.01	<.02	<.02	.14	.07	26,000	990
Aug. 2	.03	.03	.97	.70	.01	.01	<.02	<.02	.08	.04	1,700	--
Cane Bayou at U.S. Highway 190 near Mandeville, site 10												
Apr. 13	--	.03	--	.52	--	<.01	--	<.02	--	.05	K220	K760
May 12	--	.03	--	.43	--	.01	--	<.02	--	.03	280	--
June 8	.09	.01	.91	.57	.01	.01	<.02	<.02	.09	<.02	K29	K27
Aug. 2	.10	.06	1.0	.68	.01	.01	<.02	<.02	.14	.06	1,200	250
Bayou Lacombe 1 mile north of Interstate-12 near St. Tammany, site 11												
Apr. 13	--	.01	--	.32	--	<.01	--	<.02	--	<.02	450	380
June 8	.03	.03	.27	<.20	.01	<.01	.04	.04	<.02	<.02	K40	200
Aug. 2	.01	.01	.47	.33	.01	.01	<.02	<.02	.03	.03	120	K120
Bayou Lacombe near Lacombe, site 12												
Apr. 13	--	.02	--	.31	--	<.01	--	<.02	--	.03	580	820
May 12	.03	.03	.37	.30	.01	<.01	<.02	<.02	<.02	<.02	270	--
June 8	.02	.02	.74	.33	.01	.01	<.02	<.02	.05	<.02	K60	K37
Aug. 2	.01	.01	.60	.37	.01	.01	<.02	<.02	.02	.02	250	160

Table 3. Nutrients and bacteria concentrations determined for selected surface-water sites in St. Tammany Parish, Louisiana, April-August 1995 —Continued

Date	Nitrogen, ammonia, total, in mg/L as N	Nitrogen, ammonia, dissolved, in mg/L as N	Nitrogen, organic, total, in mg/L as N	Nitrogen, organic, dissolved, in mg/L as N	Nitrogen, nitrite, total, in mg/L as N	Nitrogen, nitrite, dissolved, in mg/L as N	Nitrogen, nitrate, total, in mg/L as N	Nitrogen, nitrate, dissolved, in mg/L as N	Phos-phorus, total, in mg/L as P	Phos-phorus, dissolved, in mg/L as P	Coliform bacteria, fecal, in cols/100 mL	Strepto-cocci bacteria, fecal, in cols/100 mL
Bayou Lacombe at mouth, site 13												
Apr. 13	--	0.02	--	0.36	--	<0.01	--	<0.02	--	0.03	640	580
June 8	0.02	.02	0.57	.36	<0.01	<.01	0.02	.02	0.04	<.02	120	K20
Aug. 2	.02	.01	.52	.33	.01	<.01	<.02	<.02	.02	.02	420	K70
Bayou Liberty at Bonfouca, site 14												
Apr. 13	--	.01	--	.46	--	<.01	--	<.02	--	<.02	820	1,200
May 12	.14	.04	1.7	.28	.01	<.01	.03	<.02	.07	.03	1,000	--
June 9	.03	.01	.75	.44	.01	.01	<.02	<.02	.07	<.02	210	K20
Aug. 1	.08	.06	.82	.47	.01	.01	.03	.03	.13	.10	380	K2,400
Bayou Bonfouca at Louisiana Highway 433 at Slidell, site 15												
Apr. 13	--	.03	--	.38	--	<.01	--	<.02	--	0.04	5,500	1,900
May 12	.07	.07	.47	.45	.01	.01	.02	<.02	.06	<.02	4,000	--
June 9	.12	.06	.77	.34	.02	.01	<.02	<.02	.12	.02	210	57
Aug. 1	.23	.22	.59	.35	.02	.01	.05	.05	.10	.05	K5,600	K4,100
Bogue Chitto near Bush, site 16												
Apr. 12	--	.06	--	.32	--	.01	--	.18	--	.02	30,000	14,000
May 12	--	.07	--	.39	--	.01	--	.19	--	.06	1,000	--
June 8	.02	.01	.29	<.20	.01	<.01	.31	.31	.05	<.02	100	K1,200
Aug. 1	.02	.02	.27	<.20	.01	.01	.19	.19	.04	.02	K50	K980
West Pearl River at U.S. Highway 90, site 17												
Apr. 13	--	.04	--	.23	--	<.01	--	.11	--	.05	1,300	620
June 9	.04	.03	.49	.30	.01	.01	.27	.27	.14	.02	K57	440
Aug. 1	.05	.04	.62	.28	.01	.01	.05	.05	.12	.02	K130	260

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Bacteria

Fecal-coliform bacteria have long been used as indicators of the sanitary condition of waters because they originate from the intestinal tracts of warmblooded animals. The Louisiana Department of Environmental Quality (1994) has established water-quality standards for fecal-coliform bacteria. For primary contact recreation (prolonged contact such as swimming), based on a minimum of not less than five samples taken over not more than a 30-day period, the fecal-coliform content shall not exceed a log mean of 200 cols/100 mL. Also, not more than 10 percent of the total samples during any 30-day period, or 25 percent of the monthly samples collected during a year, shall exceed 400 cols/100 mL. For secondary contact recreation (incidental or accidental contact, such as fishing or boating), based on a minimum of not less than five samples taken over not more than a 30-day period, the fecal-coliform content shall not exceed a log mean of 1,000 cols/100 mL, nor shall more than 10 percent of the total samples collected during any 30-day period equal or exceed 2,000 cols/100 mL.

Fecal-streptococcus bacteria also were analyzed as an additional indicator of sewage contamination. Analysis of fecal-streptococcus concentrations can be misleading, however, because of false positives from naturally occurring soil bacteria. The results are presented primarily to supplement the fecal-coliform information as a quality-control check.

Results of bacterial analyses are listed in table 3; fecal-coliform concentrations also are shown graphically in appendix B. During April, the sample from the Tchefuncte River near Covington (site 1) had a fecal-coliform concentration of 22,000 cols/100 mL. The sample from the Bogue Chitto had a concentration of 30,000 cols/100 mL. The very high fecal-coliform concentrations at these sites indicate that, although the sampling at these sites was conducted 2 days after the heavy rains began, the water quality of the larger streams still was degraded greatly. In contrast, the smaller streams sampled on April 13 (Bayous Chinchouba, Castine, Lacombe, and Liberty, and Cane Bayou) all had concentrations below 1,000 cols/100 mL. The fecal-coliform concentrations at Bayou Castine and Cane Bayou were 300 and 220 cols/100 mL, respectively. This is apparently related to the smaller drainage areas of Bayou Castine and Cane Bayou, which were flushed out more quickly.

Peak concentrations of fecal-coliform bacteria were lower 2 days after the May storms than after the April storms. Sites 1 and 16 had a fecal-coliform concentration of 1,000 cols/100 mL. This corresponds with the BOD measurements that indicated much of the organic matter had been flushed out of the basins in April.

Analysis of water samples collected in June indicated much lower fecal-coliform concentrations at all sites. The lack of rainfall apparently reduced nonpoint-source inputs from storm sewers and nonsewered runoff. The highest concentration recorded in June was 210 cols/100 mL at sites 14 and 15.

Fecal-coliform bacteria concentrations in samples collected in August varied, which reflect the effects of small, isolated storms in the study area. Bayou Castine, sampled immediately after a storm, had a fecal-coliform concentration of 26,000 cols/100 mL. The stream was resampled 24 hours later, and the fecal-coliform concentration had decreased to 1,700 cols/100 mL. This is an indication of the rapid water-quality changes that typically occur in small streams.

SUMMARY

A water-quality survey of 17 sites on 11 streams in St. Tammany Parish, Louisiana, was conducted April-August 1995 to determine physical and chemical-related properties, concentrations of chemical constituents, which included major inorganic ions and nutrients, and concentrations of fecal-coliform bacteria. The streams were sampled to assess the effects of different streamflow conditions on the concentrations of water-quality constituents. The water-quality properties and constituents selected for analysis include those that generally are indicative of altered organic-material inputs from both point and nonpoint human sources, as well as naturally-occurring sources. Results of the analyses were used to evaluate the effects of these organic-material inputs on the water quality of the 11 streams. The streams included in the study were Tchefuncte River, Bogue Falaya, Abita River, Bayou Chinchouba, Bayou Castine, Cane Bayou, Bayou Lacombe, Bayou Liberty, Bayou Bonfouca, Bogue Chitto, and West Pearl River. Two of the sites, Bogue Chitto near Bush and West Pearl River at U.S. Highway 90, reflect the water quality of streams outside of the most rapidly developing areas of the parish.

The small number of water-quality samples collected during the study and the time period allotted for sample collection necessitated sample collection under several hydrologic conditions: a period of wet weather and sustained high river stages; a period of local storms several days apart and river stages typical of that situation; and a period of dry weather and low river stages. The collection of samples during these three major weather categories lessened many of the biases associated with a limited number of samples.

A series of intense storms produced flooding during the spring of 1995. Intense storms moved through St. Tammany Parish on March 7, April 10, and May 8-10. The April 10 storm produced 5-7 inches of rainfall in a 24-hour period and caused widespread flooding in the towns of Covington and Slidell. On May 9-10, another storm produced 15.75 inches of rainfall in a 24-hour period and caused widespread flooding in Slidell.

Dissolved-oxygen concentrations during the study generally were at or above the minimum concentrations considered necessary by the Louisiana Department of Environmental Quality for freshwater fish populations (5.0 mg/L, milligrams per liter) and estuarine fish populations (4.0 mg/L). The major exceptions are at or near the downstream reaches of small streams such as the Abita River at U.S. Highway 190 and Bayou Chinchouba at Causeway Access Road, Bayou Castine at U.S. Highway 190, Cane Bayou at U.S. Highway 190, and Bayou Lacombe near Lacombe. In August, when high water temperatures combined with little or no downstream flow, dissolved-oxygen concentrations were typically low, such as 1.4 mg/L at Abita River at U.S. Highway 190; 2.7 mg/L at Bayou Chinchouba at Causeway Access Road; 2.0 at Bayou Castine at U.S. Highway 190; and 0.9 mg/L at Cane Bayou at U.S. Highway 190. During the June sampling, dissolved-oxygen concentrations indicated that two sites, Tchefuncte River at Madisonville and Bayou Liberty at Bonfouca, were supersaturated with oxygen; the Tchefuncte River site had 122 percent and the Bayou Liberty site had 114 percent of the maximum oxygen concentration expected at that temperature and barometric pressure. This indicated a high level of photosynthetic activity by phytoplankton that is releasing oxygen into the water faster than it can diffuse. The results from the 5-day biochemical oxygen demand analysis indicated that the amount of organic matter present at the sampling sites related more to basin size and the time since the last major rainfall, than to the degree of urbanization.

The concentrations of inorganic constituents in streams draining the mixed pine forests generally are lower than in other streams in southern Louisiana. The Abita River, in particular, has very low concentrations of major ions and a low alkalinity that ranged only from 2 to 9 mg/L at Abita Springs and 2 to 31 mg/L at U.S. Highway 190. This indicates that the stream has very little buffering capacity. The upper reach of Bayou Lacombe (1 mile north of Interstate-12) similarly has little buffering capacity. This makes these streams particularly susceptible to adverse effects from accidental spills of strong acids or bases.

Nutrients concentrations varied, and supported bacteria data that indicated degraded water quality that typically occurs during storms is flushed out quickly, from less than 1 day in the smaller streams to less than 3 days in larger streams such as the Bogue Chitto. The larger the drainage basin, the longer it takes for the stream to recover. The dissolved-nitrate concentrations in water from the Bogue Chitto-West Pearl River system (0.18-0.31 mg/L in the Bogue Chitto and 0.05-0.27 mg/L in the West Pearl River) could, in combination with the dissolved-phosphorus concentrations (0.02-0.06 mg/L in the Bogue Chitto-West Pearl River system), produce eutrophic conditions resulting in algal blooms. The fact that algal blooms are rarely observed in this system indicates that other factors are restricting algal growth. One likely factor is reduced light penetration, due to the turbidity of the water, inhibiting algal growth and reproduction.

A different nutrient pattern was apparent in the smaller streams. The storms in April and May produced rapid rises and falls in stage. Water-quality samples collected 1-3 days after the heaviest rainfall indicated low nutrient concentrations at streams such as Bayou Castine, Cane Bayou, and Bayou Lacombe. Nutrients available for transport from these small basins had already moved through the system (the first-flush effect) before sampling.

Fecal-coliform bacteria concentrations were highest in April and August and lowest in June. During April, the sample from the Tchefuncte River near Covington had a fecal-coliform concentration of 22,000 cols/100 mL (colonies per 100 milliliters). The sample from Bogue Chitto near Bush had a concentration of 30,000 cols/100 mL. The very high fecal-coliform concentrations at these sites indicate that, although the sampling was conducted 2 days after the heavy rains began, the water quality of the larger streams still was degraded greatly.

Peak fecal-coliform concentrations were lower 2 days after the May storms than after the April storms. Both Tchefuncte River near Covington and Bogue Chitto near Bush had a fecal-coliform concentration of 1,000 cols/100 mL. This corresponds with the biochemical oxygen demand results that indicated much of the organic matter had been flushed out of the basins in April.

The samples collected in June had much lower fecal-coliform concentrations at all sites. The lack of rainfall apparently reduced sewage inputs. The highest concentration recorded in June was 210 cols/100 mL at Bayou Liberty at Bonfouca and Bayou Bonfouca at Louisiana Highway 433 at Slidell.

Samples collected in August varied, which reflected the effects of small, isolated storms in the study area. Bayou Castine, sampled immediately after a storm, had a fecal-coliform concentration of 26,000 cols/100 mL. The stream was resampled 24 hours later, and the fecal-coliform concentration had decreased to 1,700 cols/100 mL. This is an indication of the rapid water-quality changes that typically occur in small streams.

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Appendix A

Statistical Summary Of U.S. Geological Survey Historical Surface-Water-Quality Data for St. Tammany Parish, Louisiana

STATION NUMBER: 07375050 STATION NAME: TCHEFUNCTE R NR COVINGTON, LA DRAINAGE AREA: 145 SQ MI

STATE: LOUISIANA COUNTY: ST TAMMANY LATITUDE/LONGITUDE: 302940 0901010

STATISTICAL SUMMARY OF SELECTED WATER QUALITY DATA COLLECTED FROM OCT 1958 TO JUL 1993

		DESCRIPTIVE STATISTICS			PERCENT OF SAMPLES IN WHICH VALUES WERE LESS THAN OR EQUAL TO THOSE SHOWN				
WATER-QUALITY CONSTITUENT	SAMPLE SIZE	MAXIMUM	MINIMUM	MEAN	95 %	75 %	(MEDIAN) 50 %	25 %	5 %
00010 WATER TEMPERATUR (DEGREES)	92	33.500	6.000	19.022	20.175	24.000	19.000	15.000	8.650
00020 AIR TEMPERATURE DEGREES	8	32.000	14.000	22.250	32.000	29.375	20.750	16.000	14.000
00025 AIR PRESSURE (MM OF HG)	35	772.000	750.000	761.171	770.400	765.000	760.000	759.000	754.000
00060 DISCHARGE CFS	24	852.000	20.000	130.292	770.750	114.500	69.000	52.000	24.750
00061 DISCHARGE, INST. CFS	57	1650.000	27.000	181.667	709.899	158.000	90.000	59.000	44.100
00065 GAGE HEIGHT (FEET)	68	20.620	5.190	10.756	14.902	11.555	10.340	9.733	5.751
00070 TURBIDITY (JCU)	34	40.000	2.000	11.500	36.250	15.000	10.000	6.000	2.000
00075 TURBIDITY (MG/L) (MG/L AS SIO2)	1	5.000	--	--	--	--	--	--	--
00076 TURBIDITY (NTU)	85	62.000	0.700	11.145	29.700	16.000	7.000	3.950	1.530
00080 COLOR PLATINUM-COBAL	95	120.000	0.000	34.105	80.000	50.000	30.000	15.000	5.000
00095 SPECIFIC CONDUCT US/CM @ 25C	118	57.000	26.000	38.737	52.000	42.000	38.000	35.000	28.950
00300 OXYGEN DISSOLVED (MG/L)	89	12.400	6.200	8.691	11.250	9.450	8.700	7.700	7.000
00310 BOD 5-DAY AT 20 (MG/L)	87	5.400	0.000	1.468	3.760	1.800	1.300	0.700	0.200
00400 PH, WH, FIELD (STANDARD UNIT	118	7.400	5.200	6.399	7.100	6.700	6.400	6.100	5.695
00403 PH, WH, LABORATO (STANDARD UNIT	55	8.000	5.900	6.862	7.800	7.200	6.800	6.400	6.100
00405 CARBON DIOXIDE D (MG/L AS CO2)	61	32.000	1.700	8.954	24.500	11.000	7.800	4.800	2.140
00410 ALKALINITY, WH, FE (MG/L AS CACO3	118	18.000	2.000	9.093	13.050	11.000	9.000	7.000	5.000
00440 BICARBONATE, WH, F (MG/L AS HCO3)	62	16.000	2.000	10.468	15.000	12.250	11.000	8.000	4.300
00445 CARBONATE, WH, FET (MG/L AS CO3)	52	0.000	--	--	--	--	--	--	--
00556 OIL AND GREASE R (MG/L)	1	1.000	--	--	--	--	--	--	--
00600 NITROGEN TOTAL (MG/L AS N)	77	2.800	0.280	0.957	2.010	1.250	0.870	0.590	0.347
00602 NITROGEN DISSOLV (MG/L AS N)	19	1.700	0.410	0.956	1.700	1.200	1.000	0.650	0.410
00605 NITROGEN ORGANIC (MG/L AS N)	77	2.700	0.140	0.581	1.230	0.705	0.500	0.330	0.170
00607 NITROGEN ORGANIC (MG/L AS N)	18	1.000	0.240	0.660	1.000	0.862	0.715	0.428	0.240
00608 NITROGEN AMMONIA (MG/L AS N)	67	0.440	0.000	0.070	0.272	0.090	0.040	0.020	0.004
00610 NITROGEN AMMONIA (MG/L AS N)	66	0.450	0.000	0.076	0.260	0.093	0.050	0.020	0.010

WATER-QUALITY CONSTITUENT	SAMPLE SIZE	MAXIMUM	MINIMUM	MEAN	95 %	75 %	(MEDIAN) 50 %	25 %	5 %
	DESCRIPTIVE STATISTICS				PERCENT OF SAMPLES IN WHICH VALUES WERE LESS THAN OR EQUAL TO THOSE SHOWN				
00613 NITROGEN,NITRITE MG/L AS N	31	0.030	--	0.008*	*0.018	*0.010	*0.007	*0.005	*0.003
00615 NITROGEN,NITRITE MG/L AS N	8	--	--	--	--	--	--	--	--
00618 NITROGEN NITRATE (MG/L AS N)	27	0.490	0.000	0.164	0.474	0.310	0.100	0.030	0.008
00623 NITRO AMN & ORG (MG/L AS N)	38	1.200	0.040	0.593	1.200	0.803	0.550	0.340	0.192
00624 NITROGEN SUSPEND (MG/L AS N)	32	1.900	0.000	0.229	1.250	0.335	0.135	0.005	0.000
00625 NITROGEN AMN+ORG (MG/L AS N)	84	2.700	--	0.617*	*1.375	*0.807	*0.500	*0.325	*0.159
00630 NO2 + NO3 TOTAL (MG/L AS N)	87	2.200	0.020	0.295	0.588	0.330	0.260	0.170	0.050
00631 NO2 + NO3 DISSOL (MG/L AS N)	68	2.200	0.000	0.282	0.487	0.330	0.255	0.130	0.044
00650 PHOSPHATE TOTAL (MG/L AS PO4)	11	0.670	0.090	0.300	0.670	0.430	0.250	0.120	0.090
00660 PHOSPHATE ORTHO. (MG/L AS PO4)	47	0.310	0.030	0.126	0.298	0.150	0.120	0.090	0.060
00665 PHOSPHORUS TOTAL (MG/L AS P)	86	0.350	0.020	0.099	0.216	0.120	0.080	0.060	0.034
00666 PHOSPHORUS DISS. (MG/L AS P)	86	0.180	0.000	0.046	0.120	0.070	0.050	0.030	0.014
00671 PHOSPHORUS ORTHO (MG/L AS P)	50	0.100	--	0.040*	*0.094	*0.050	*0.030	*0.020	*0.011
00680 CARBON ORGANIC T (MG/L AS C)	23	12.000	1.500	4.487	11.600	5.200	4.200	2.500	1.540
00681 CARBON ORGANIC D (MG/L AS C)	13	14.000	2.700	7.592	14.000	11.500	6.600	4.150	2.700
00689 CARBON ORGANIC S (MG/L AS C)	13	2.000	0.100	0.923	2.000	1.450	0.800	0.350	0.160
00720 CYANIDE TOTAL (MG/L AS CN)	1	0.000	--	--	--	--	--	--	--
00900 HARDNESS TOTAL (MG/L AS CAO3)	118	11.000	5.000	7.695	10.000	8.250	8.000	7.000	6.000
00902 NONCARBONATE HAR (MG/L AS CACO3	82	70.000	0.000	1.537	4.000	1.000	0.000	0.000	0.000
00915 CALCIUM DISSOLVE (MG/L AS CA)	118	2.700	1.100	1.820	2.500	2.100	1.800	1.600	1.200
00925 MAGNESIUM DISSOL (MG/L AS MG)	118	1.200	0.100	0.758	1.100	0.940	0.800	0.697	0.200
00930 SODIUM DISSOLVED (MG/L AS NA)	118	7.800	1.600	3.817	5.505	4.225	3.850	3.200	2.300
00931 SODIUM ADSORPTIO (RATIO)	118	1.000	0.200	0.599	0.900	0.700	0.600	0.500	0.400
00932 SODIUM, PERCENT PERCENT	119	62.000	24.000	46.277	58.000	51.000	47.000	42.000	31.000
00933 SODIUM+POTASSIUM (MG/L AS NA)	11	7.200	4.700	5.582	7.200	6.100	5.500	5.000	4.700
00935 POTASSIUM DISSOL (MG/L AS K)	118	3.900	0.400	1.494	3.000	1.900	1.300	0.975	0.600
00940 CHLORIDE DISSOLV (MG/L AS CL)	118	7.500	2.400	4.564	6.505	5.200	4.400	4.000	3.000
00945 SULFATE DISSOLVE (MG/L AS SO4)	118	10.000	0.000	2.306	5.030	3.025	2.000	1.000	0.330
00950 FLUORIDE DISSOLV (MG/L AS F)	118	0.200	--	0.065*	*0.200	*0.100	*0.051	*0.031	*0.015
00955 SILICA DISSOLVED (MG/L AS SIO2)	118	15.000	3.500	10.824	14.000	13.000	11.500	9.650	5.200
01000 ARSENIC DISSOLVE (UG/L AS AS)	55	3.000	--	0.834*	*1.200	*1.000	*0.770	*0.605	*0.427
01001 ARSENIC SUSPENDE (UG/L AS AS)	18	1.000	--	1.000*	*1.000	*1.000	*1.000	*1.000	*1.000
01002 ARSENIC TOTAL (UG/L AS AS)	19	3.000	--	1.062*	*3.000	*1.000	*1.000	*0.732	*0.518
01003 ARSENIC BOT. MAT (UG/G AS AS)	1	0.000	--	--	--	--	--	--	--
01005 BARIUM DISSOLVED (UG/L AS BA)	62	200.000	--	29.472*	*36.714	*30.000	*25.000	*21.000	*19.000
01006 BARIUM SUSPENDED (UG/L AS BA)	12	180.000	0.000	40.833	180.000	80.000	0.000	0.000	0.000
01007 BARIUM TOTAL (UG/L AS BA)	14	200.000	--	76.918*	*200.000	*100.000	*52.887	*29.532	*15.389
01010 BERYLLIUM DISSOL (UG/L AS BE)	35	--	--	--	--	--	--	--	--
01025 CADMIUM DISSOLVE (UG/L AS CD)	55	2.000	--	0.659*	*2.000	*0.810	*0.561	*0.377	*0.222
01026 CADMIUM SUSPENDE (UG/L AS CD)	8	1.000	0.000	0.125	1.000	0.000	0.000	0.000	0.000

WATER-QUALITY CONSTITUENT	SAMPLE SIZE	MAXIMUM	MINIMUM	MEAN	95 %	75 %	(MEDIAN) 50 %	25 %	5 %
	DESCRIPTIVE STATISTICS				PERCENT OF SAMPLES IN WHICH VALUES WERE LESS THAN OR EQUAL TO THOSE SHOWN				
01027 CADMIUM TOTAL (UG/L AS CD)	19	--	--	--	--	--	--	--	--
01028 CADMIUM BOT. MAT (UG/G AS CD)	1	2.000	--	--	--	--	--	--	--
01029 CHROMIUM TOTAL B (UG/G AS CR)	1	0.000	--	--	--	--	--	--	--
01030 CHROMIUM DISSOLV (UG/L AS CR)	53	10.000	--	1.033*	*5.800	*1.000	*0.358	*0.137	*0.032
01031 CHROMIUM SUSPEND (UG/L AS CR)	17	30.000	0.000	3.529	30.000	5.000	0.000	0.000	0.000
01032 CHROMIUM HEXAVAL (UG/L AS CR)	1	0.000	--	--	--	--	--	--	--
01034 CHROMIUM TOTAL (UG/L AS CR)	19	30.000	--	7.450*	*30.000	*10.000	*4.417	*2.092	*0.709
01035 COBALT DISSOLVED (UG/L AS CO)	62	4.000	--	1.127*	*3.000	*1.399	*0.896	*0.566	*0.237
01036 COBALT SUSPENDED (UG/L AS CO)	7	1.000	0.000	0.143	1.000	0.000	0.000	0.000	0.000
01037 COBALT TOTAL (UG/L AS CO)	19	4.000	--	0.794*	*4.000	*1.000	*0.443	*0.202	*0.088
01040 COPPER DISSOLVED (UG/L AS CU)	54	9.000	--	3.107*	*9.000	*4.000	*2.000	*1.000	*1.000
01041 COPPER SUSPENDED (UG/L AS CU)	15	4.000	0.000	1.600	4.000	2.000	2.000	0.000	0.000
01042 COPPER TOTAL (UG/L AS CU)	19	13.000	--	4.911*	*13.000	*6.000	*4.000	*3.000	*1.302
01043 COPPER BOT. MAT. (UG/G AS CU)	1	0.000	--	--	--	--	--	--	--
01044 IRON SUSPENDED (UG/L AS FE)	19	1100.000	70.000	394.211	1100.000	520.000	290.000	180.000	70.000
01045 IRON TOTAL (UG/L AS FE)	19	1300.000	320.000	640.000	1300.000	840.000	570.000	400.000	320.000
01046 IRON DISSOLVED (UG/L AS FE)	78	590.000	30.000	257.820	550.000	330.000	240.000	180.000	59.000
01049 LEAD DISSOLVED (UG/L AS PB)	55	8.000	--	1.988*	*6.200	*3.000	*1.051	*0.866	*0.340
01050 LEAD SUSPENDED (UG/L AS PB)	14	27.000	0.000	6.143	27.000	9.000	4.000	1.750	0.000
01051 LEAD TOTAL (UG/L AS PB)	19	34.000	--	5.873*	*34.000	*9.000	*3.000	*2.000	*0.636
01052 LEAD TOTAL BOT. (UG/G AS PB)	1	--	--	--	--	--	--	--	--
01053 MANGANESE BOT.MA (UG/G AS MN)	1	34.000	--	--	--	--	--	--	--
01054 MANGANESE SUSPEN (UG/L AS MN)	17	80.000	0.000	20.588	80.000	30.000	20.000	8.000	0.000
01055 MANGANESE TOTAL (UG/L AS MN)	17	200.000	20.000	64.118	200.000	80.000	60.000	40.000	20.000
01056 MANGANESE DISSOL (UG/L AS MN)	62	120.000	2.000	45.274	83.700	63.250	40.000	28.500	14.300
01060 MOLYBDENUM DISSO (UG/L AS MO)	43	--	--	--	--	--	--	--	--
01065 NICKEL DISSOLVED (UG/L AS NI)	54	5.000	--	1.544*	*4.250	*2.250	*1.000	*0.605	*0.258
01066 NICKEL SUSPENDED (UG/L AS NI)	10	5.000	0.000	1.400	5.000	2.250	1.000	0.000	0.000
01067 NICKEL TOTAL (UG/L AS NI)	12	5.000	0.000	2.667	5.000	4.500	3.000	1.000	0.000
01075 SILVER DISSOLVED (UG/L AS AG)	62	--	--	--	--	--	--	--	--
01076 SILVER SUSPENDED (UG/L AS AG)	14	0.000	--	--	--	--	--	--	--
01077 SILVER TOTAL (UG/L AS AG)	22	--	--	--	--	--	--	--	--
01080 STRONTIUM DISSOL (UG/L AS SR)	43	25.000	10.000	16.977	22.600	19.000	17.000	15.000	12.000
01085 VANADIUM DISSOLV (UG/L AS V)	43	--	--	--	--	--	--	--	--
01090 ZINC DISSOLVED (UG/L AS ZN)	55	27.000	--	9.875*	*22.400	*12.000	*9.000	*5.000	*2.952
01091 ZINC SUSPENDED (UG/L AS ZN)	17	80.000	0.000	17.706	80.000	25.000	10.000	5.500	0.000
01092 ZINC TOTAL (UG/L AS ZN)	17	90.000	--	28.173*	*90.000	*30.000	*30.000	*14.291	*8.984
01093 ZINC BOTTOM MATE (UG/G AS ZN)	1	4.000	--	--	--	--	--	--	--
01106 ALUMINUM DISSOLV (UG/L AS AL)	43	390.000	10.000	110.698	380.000	170.000	70.000	40.000	10.000
01130 LITHIUM DISSOLVE (UG/L AS LI)	43	--	--	--	--	--	--	--	--

WATER-QUALITY CONSTITUENT		SAMPLE SIZE	MAXIMUM	MINIMUM	MEAN	95 %	75 %	(MEDIAN) 50 %	25 %	5 %
			DESCRIPTIVE STATISTICS			PERCENT OF SAMPLES IN WHICH VALUES WERE LESS THAN OR EQUAL TO THOSE SHOWN				
01145 SELENIUM DISSOLV	(UG/L AS SE)	61	--	--	--	--	--	--	--	--
01146 SELENIUM SUSPEND	(UG/L AS SE)	15	1.000	0.000	0.067	1.000	0.000	0.000	0.000	0.000
01147 SELENIUM TOTAL	(UG/L AS SE)	19	--	--	--	--	--	--	--	--
01170 IRON BOTTOM MATE	(UG/G AS FE)	1	260.000	--	--	--	--	--	--	--
31616 COLIFORM, FECAL	COLS./100 ML	1	60.000	--	--	--	--	--	--	--
31625 COLIFORM FECAL 0	COLS./100 ML	85	25000.000	4.000	944.177	5539.993	525.000	210.000	120.000	36.400
31673 FECAL STRPT KF A	COLS./100 ML	85	29000.000	10.000	1711.153	4639.996	920.000	300.000	160.000	53.300
50086 SETTLEABLE MATTE	ML/L/HR	2	--	--	--	--	--	--	--	--
60050 PHYTO TYPE-I	CELLS/ML	25	74000.000	13.000	9662.400	71900.000	4550.000	1800.000	570.000	32.200
70299 RESIDUE SUSPEN 1	MG/L	1	3.000	--	--	--	--	--	--	--
70300 RESIDUE DIS 180C	MG/L	92	53.000	20.000	37.196	50.000	41.000	36.500	33.000	27.300
70301 DISSOLVED SOLIDS	MG/L	113	46.000	18.000	32.027	41.300	35.000	32.000	30.000	21.800
70302 DISSOLVED SOLIDS	TONS/DAY	76	125.000	1.440	17.897	88.515	16.425	8.480	5.790	3.446
70303 RESIDUE DIS TON/	T/AC-FT	115	0.070	0.020	0.049	0.070	0.050	0.050	0.040	0.030
70331 SED-SUSP-SIEVE-.	%	88	100.000	22.000	79.307	100.000	94.750	84.000	64.000	49.450
70507 PHOS ORTHO TOT A	MG/L AS P	7	0.170	0.040	0.087	0.170	0.130	0.070	0.040	0.040
71845 NITROGEN, NH4, T	MG/L AS NH4	64	0.580	0.000	0.101	0.340	0.127	0.070	0.032	0.010
71846 NITR. NH4 AS NH4	MG/L AS NH4	64	0.570	0.000	0.094	0.385	0.120	0.060	0.030	0.002
71850 N, NITRATE TOTAL	MG/L AS NO3	11	0.600	0.100	0.255	0.600	0.400	0.200	0.100	0.100
71851 NITR. NO3 AS NO3	MG/L AS NO3	28	2.200	0.000	0.704	2.110	1.350	0.400	0.105	0.045
71885 IRON	UG/L AS FE	13	370.000	0.000	137.692	370.000	210.000	120.000	50.000	0.000
71886 PHOSPHORUS TOT P	MG/L AS PO4	39	1.100	0.060	0.287	0.670	0.310	0.210	0.180	0.090
71887 NITROGEN, TOTAL	MG/L AS NO3	40	12.000	1.200	4.610	9.475	6.200	4.150	2.625	1.810
71890 MERCURY DISSOLVE	UG/L AS HG	54	0.300	--	0.041*	*0.125	*0.050	*0.024	*0.012	*0.004
71895 MERCURY SUSPENDE	UG/L AS HG	15	0.300	0.000	0.080	0.300	0.100	0.100	0.000	0.000
71900 MERCURY, TOT.REC	UG/L AS HG	20	0.300	--	0.066*	*0.295	*0.100	*0.041	*0.020	*0.007
71921 MERCURY BTM	UG/G AS HG	1	0.020	--	--	--	--	--	--	--
80154 CONCENTRATION,S.	MG/L	88	162.000	1.000	30.989	85.000	42.000	23.500	13.250	5.900
80155 DISCHARGE,SUSP.S	T/DAY	73	196.000	0.150	19.119	109.500	16.000	4.600	2.450	0.732
80164 SED-BED-SIEVE-.0	%	1	0.000	--	--	--	--	--	--	--
82068 POTSSSIUM 40 DIS	(PCI/L AS K40)	23	7.000	0.700	1.452	6.060	1.500	1.000	0.800	0.720
82398 SAMPLING METHOD	METHOD, CODES	30	8010.000	10.000	6943.333	8010.000	8010.000	8010.000	8010.000	10.000
84164 SAMPLER TYPE COD	CODE	4	8010.000	8010.000	--	--	--	--	--	--
90095 SPECIFIC CONDUCT	MICROSIEMENS/C	55	62.000	28.000	41.182	55.400	44.000	39.000	37.000	31.800
90410 ALKALINITY	MG/L AS CACO3	55	18.000	5.000	9.844	16.200	11.000	10.000	8.000	5.800
98194 BLUE-GREEN ALGAE	2180103070090	1	360.000	--	--	--	--	--	--	--
99430 CARBONATE ALKALI	MG/L	32	17.000	3.000	8.719	14.400	10.000	8.000	7.000	4.300
99440 BICARBONATE	MG/L AS HCO3	32	21.000	4.000	10.781	17.750	12.750	10.000	9.000	5.300
99445 CARBONATE	MG/L AS CO3	8	0.000	--	--	--	--	--	--	--
99890 SULFATE, D. UNCO	(MG/L)	3	--	--	--	--	--	--	--	--

* - VALUE IS ESTIMATED BY USING A LOG-PROBABILITY REGRESSION TO PREDICT THE VALUES OF DATA BELOW THE DETECTION LIMIT

STATION NUMBER: 07375000 STATION NAME: TCHEFUNCTE RIVER NR FOLSOM, LA DRAINAGE AREA: 103 SQ MI

STATE: LOUISIANA COUNTY: ST TAMMANY LATITUDE/LONGITUDE: 303657 0901455

STATISTICAL SUMMARY OF SELECTED WATER QUALITY DATA COLLECTED FROM OCT 1943 TO JUL 1980

WATER-QUALITY CONSTITUENT		DESCRIPTIVE STATISTICS				PERCENT OF SAMPLES IN WHICH VALUES WERE LESS THAN OR EQUAL TO THOSE SHOWN				
		SAMPLE SIZE	MAXIMUM	MINIMUM	MEAN	95 %	75 %	(MEDIAN) 50 %	25 %	5 %
00010 WATER TEMPERATUR	(DEGREES)	8	24.000	9.000	20.125	24.000	24.000	23.500	16.250	9.000
00060 DISCHARGE	CFS	27	107.000	38.000	60.407	107.000	66.000	62.000	46.000	38.000
00080 COLOR	PLATINUM-COBAL	21	30.000	0.000	12.381	29.000	20.000	10.000	5.000	0.500
00095 SPECIFIC CONDUCT	US/CM @ 25C	34	38.000	25.000	30.029	37.250	31.250	30.000	27.000	25.000
00400 PH, WH, FIELD	(STANDARD UNIT	32	6.800	5.600	6.181	6.670	6.400	6.200	6.000	5.600
00405 CARBON DIOXIDE D	(MG/L AS CO2)	21	28.000	2.500	9.724	28.000	13.000	6.400	4.750	2.610
00410 ALKALINITY,WH,FE	(MG/L AS CACO3	35	12.000	3.000	7.286	11.700	8.000	7.000	7.000	4.600
00440 BICARBONATE,WH,F	(MG/L AS HCO3)	34	15.000	4.000	8.971	13.500	10.000	9.000	8.000	5.500
00445 CARBONATE,WH,FET	(MG/L AS CO3)	29	0.000	--	--	--	--	--	--	--
00618 NITROGEN NITRATE	(MG/L AS N)	15	0.110	0.000	0.040	0.110	0.090	0.050	0.020	0.000
00900 HARDNESS TOTAL	(MG/L AS CAO3)	32	10.000	4.000	6.344	10.000	7.000	6.000	5.000	4.650
00902 NONCARBONATE HAR	(MG/L AS CACO3	33	5.000	0.000	0.576	3.600	0.000	0.000	0.000	0.000
00915 CALCIUM DISSOLVE	(MG/L AS CA)	32	2.300	0.500	1.544	2.300	1.975	1.600	1.225	0.630
00925 MAGNESIUM DISSOL	(MG/L AS MG)	32	1.200	0.100	0.591	1.200	0.700	0.600	0.400	0.100
00930 SODIUM DISSOLVED	(MG/L AS NA)	32	4.100	1.500	2.747	3.710	3.000	2.800	2.500	1.500
00931 SODIUM ADSORPTIO	(RATIO)	33	0.800	0.300	0.488	0.800	0.600	0.500	0.400	0.300
00932 SODIUM, PERCENT	PERCENT	32	60.000	30.000	44.813	58.700	51.000	46.000	39.000	30.000
00935 POTASSIUM DISSOL	(MG/L AS K)	32	1.800	0.400	0.850	1.605	1.100	0.750	0.525	0.430
00940 CHLORIDE DISSOLV	(MG/L AS CL)	34	6.100	2.900	4.209	5.725	4.700	4.050	3.750	3.125
00945 SULFATE DISSOLVE	(MG/L AS SO4)	32	4.800	0.000	0.584	2.590	0.800	0.350	0.000	0.000
00950 FLUORIDE DISSOLV	(MG/L AS F)	30	0.300	0.000	0.060	0.190	0.100	0.100	0.000	0.000
00955 SILICA DISSOLVED	(MG/L AS SIO2)	32	12.000	7.100	10.047	12.000	11.000	9.900	9.425	7.360
01046 IRON DISSOLVED	(UG/L AS FE)	15	150.000	0.000	59.333	150.000	110.000	60.000	20.000	0.000
31625 COLIFORM FECAL 0	COLS./100 ML	1	130.000	--	--	--	--	--	--	--
31673 FECAL STRPT KF A	COLS./100 ML	1	74.000	--	--	--	--	--	--	--
70300 RESIDUE DIS 180C	MG/L	13	43.000	26.000	31.077	43.000	33.500	29.000	27.000	26.000
70301 DISSOLVED SOLIDS	MG/L	32	30.000	22.000	25.031	28.700	26.000	25.000	23.250	22.650
70302 DISSOLVED SOLIDS	TONS/DAY	27	9.310	2.390	4.412	8.262	4.730	4.150	3.600	2.422
70303 RESIDUE DIS TON/	T/AC-FT	32	0.060	0.030	0.037	0.053	0.040	0.040	0.030	0.030
71850 N, NITRATE TOTAL	MG/L AS NO3	6	0.400	0.100	0.183	0.400	0.250	0.150	0.100	0.100
71851 NITR. NO3 AS NO3	MG/L AS NO3	26	0.500	0.000	0.158	0.500	0.200	0.100	0.000	0.000
71885 IRON	UG/L AS FE	18	150.000	0.000	33.889	150.000	72.500	0.000	0.000	0.000

STATION NUMBER: 02492000 STATION NAME: BOGUE CHITTO NR BUSH, LA DRAINAGE AREA: 1213 SQ MI

STATE: LOUISIANA COUNTY: ST TAMMANY LATITUDE/LONGITUDE: 303745 0895350

STATISTICAL SUMMARY OF SELECTED WATER QUALITY DATA COLLECTED FROM SEPT 1953 TO SEPT 1992

		DESCRIPTIVE STATISTICS				PERCENT OF SAMPLES IN WHICH VALUES WERE LESS THAN OR EQUAL TO THOSE SHOWN				
WATER-QUALITY CONSTITUENT		SAMPLE SIZE	MAXIMUM	MINIMUM	MEAN	95 %	75 %	(MEDIAN) 50 %	25 %	5 %
00010 WATER TEMPERATUR	(DEGREES)	175	31.500	1.000	20.280	29.100	27.000	20.000	15.000	9.400
00020 AIR TEMPERATURE	DEGREES	11	29.000	14.000	21.409	29.000	27.000	21.500	16.000	14.000
00025 AIR PRESSURE	(MM OF HG)	48	770.000	750.000	760.250	770.000	762.750	760.000	758.000	754.450
00060 DISCHARGE	CFS	93	13700.000	255.000	2010.097	9839.000	1735.000	1140.000	872.500	599.300
00061 DISCHARGE, INST.	CFS	88	38000.000	568.000	2415.489	7014.502	2320.000	1415.000	926.000	637.050
00065 GAGE HEIGHT	(FEET)	57	99.700	2.960	8.540	36.840	5.725	4.440	3.860	3.774
00070 TURBIDITY	(JCU)	71	60.000	3.000	16.127	47.000	20.000	10.000	7.000	4.000
00075 TURBIDITY (MG/L)	(MG/L AS SIO2)	7	29.000	8.000	17.714	29.000	24.000	20.000	9.000	8.000
00076 TURBIDITY	(NTU)	104	80.000	0.550	13.393	45.000	16.000	8.950	5.600	2.425
00080 COLOR	PLATINUM-COBAL	184	120.000	0.000	27.245	70.000	40.000	20.000	10.000	5.000
00095 SPECIFIC CONDUCT	US/CM @ 25C	176	187.000	19.000	44.222	52.150	46.000	44.000	40.000	32.000
00300 OXYGEN DISSOLVED	(MG/L)	156	11.900	6.400	8.366	10.315	9.175	8.200	7.500	6.785
00301 OXYGEN DIS. PERC	% OF SATURATIO	46	114.000	83.000	95.152	108.000	98.000	94.500	91.000	85.350
00310 BOD 5-DAY AT 20	(MG/L)	146	6.800	0.000	1.664	4.130	2.025	1.400	0.900	0.335
00400 PH, WH, FIELD	(STANDARD UNIT	187	7.200	5.400	6.427	7.000	6.700	6.400	6.200	5.700
00403 PH, WH, LABORATO	(STANDARD UNIT	70	8.100	5.500	6.917	7.805	7.300	6.900	6.500	6.085
00410 ALKALINITY,WH,FE	(MG/L AS CACO3	169	63.000	3.000	8.503	11.000	9.000	8.000	7.000	5.000
00440 BICARBONATE,WH,F	(MG/L AS HCO3)	109	77.000	4.000	10.569	14.500	11.000	10.000	8.000	6.000
00445 CARBONATE,WH,FET	(MG/L AS CO3)	109	0.000	--	--	--	--	--	--	--
00530 RESIDUE TOTAL	(MG/L)	1	22.000	--	--	--	--	--	--	--
00600 NITROGEN TOTAL	(MG/L AS N)	133	3.900	0.190	0.819	1.730	0.940	0.710	0.520	0.300
00602 NITROGEN DISSOLV	(MG/L AS N)	25	1.700	0.220	0.908	1.670	1.100	0.890	0.705	0.301
00605 NITROGEN ORGANIC	(MG/L AS N)	135	3.700	0.110	0.512	1.100	0.590	0.430	0.290	0.148

WATER-QUALITY CONSTITUENT	SAMPLE SIZE	DESCRIPTIVE STATISTICS MAXIMUM	MINIMUM	MEAN	PERCENT OF SAMPLES IN WHICH VALUES WERE LESS THAN OR EQUAL TO THOSE SHOWN 95 %	75 %	(MEDIAN) 50 %	25 %	5 %
00607 NITROGEN ORGANIC (MG/L AS N)	23	1.400	0.130	0.613	1.340	0.730	0.520	0.440	0.168
00608 NITROGEN AMMONIA (MG/L AS N)	88	0.220	--	0.050*	*0.130	*0.070	*0.040	*0.020	*0.008
00610 NITROGEN AMMONIA (MG/L AS N)	105	0.410	0.000	0.069	0.164	0.100	0.060	0.025	0.010
00613 NITROGEN,NITRITE MG/L AS N	44	0.010	--	0.010*	*0.010	*0.010	*0.010	*0.010	*0.010
00615 NITROGEN,NITRITE MG/L AS N	31	0.030	--	0.010*	*0.024	*0.010	*0.010	*0.006	*0.003
00618 NITROGEN NITRATE (MG/L AS N)	17	0.390	0.000	0.104	0.390	0.150	0.100	0.005	0.000
00620 NITROGEN NITRATE MG/L AS N	144	1.900	0.040	0.255	0.385	0.300	0.245	0.172	0.100
00623 NITRO AMN & ORG (MG/L AS N)	43	1.400	0.100	0.612	1.260	0.780	0.550	0.440	0.206
00624 NITROGEN SUSPEND (MG/L AS N)	36	3.300	0.000	0.244	1.410	0.238	0.090	0.012	0.000
00625 NITROGEN AMM+ORG (MG/L AS N)	138	3.800	0.100	0.561	1.200	0.693	0.490	0.300	0.199
00630 NO2 + NO3 TOTAL (MG/L AS N)	144	1.200	0.000	0.242	0.397	0.290	0.250	0.170	0.100
00631 NO2 + NO3 DISSOL (MG/L AS N)	90	0.420	0.000	0.220	0.354	0.290	0.240	0.160	0.075
00650 PHOSPHATE TOTAL (MG/L AS PO4)	14	0.250	0.000	0.091	0.250	0.127	0.060	0.045	0.000
00660 PHOSPHATE ORTHO. (MG/L AS PO4)	48	0.250	0.030	0.061	0.167	0.060	0.060	0.030	0.030
00665 PHOSPHORUS TOTAL (MG/L AS P)	144	0.410	0.010	0.073	0.150	0.090	0.060	0.050	0.030
00666 PHOSPHORUS DISS. (MG/L AS P)	107	0.240	--	0.034*	*0.102	*0.040	*0.030	*0.010	*0.006
00671 PHOSPHORUS ORTHO (MG/L AS P)	65	0.080	--	0.016*	*0.050	*0.020	*0.010	*0.007	*0.004
00680 CARBON ORGANIC T (MG/L AS C)	40	11.000	0.800	4.817	9.590	6.175	4.000	2.850	2.110
00681 CARBON ORGANIC D (MG/L AS C)	14	7.200	1.700	4.414	7.200	6.425	4.250	3.275	1.700
00689 CARBON ORGANIC S (MG/L AS C)	12	2.500	0.400	1.058	2.500	1.350	1.050	0.625	0.400
00900 HARDNESS TOTAL (MG/L AS CACO3)	187	23.000	4.000	8.845	12.600	9.000	9.000	8.000	6.000
00902 NONCARBONATE HAR (MG/L AS CACO3	135	12.000	0.000	1.407	5.000	2.000	1.000	0.000	0.000
00915 CALCIUM DISSOLVE (MG/L AS CA)	175	7.200	0.900	2.151	3.100	2.200	2.000	1.900	1.500
00916 CALCIUM TOTAL RE (MG/L AS CA)	12	2.400	1.400	1.733	2.400	1.900	1.700	1.500	1.400
00925 MAGNESIUM DISSOL (MG/L AS MG)	172	2.600	0.050	0.847	1.300	0.955	0.870	0.700	0.365
00927 MAGNESIUM TOTAL (MG/L AS MG)	12	1.300	0.700	0.908	1.300	1.000	0.900	0.800	0.700
00929 SODIUM TOTAL REC ((MG/L AS NA)	12	7.600	3.900	5.208	7.600	6.050	4.700	4.350	3.900
00930 SODIUM DISSOLVED (MG/L AS NA)	173	14.000	0.380	4.012	5.790	4.500	4.000	3.400	1.940
00931 SODIUM ADSORPTIO (RATIO)	168	1.000	0.000	0.590	0.900	0.700	0.600	0.500	0.300
00932 SODIUM, PERCENT PERCENT	171	60.000	0.000	43.310	54.400	49.000	45.000	40.000	27.200
00933 SODIUM+POTASSIUM (MG/L AS NA)	10	6.300	4.800	5.570	6.300	5.875	5.650	5.100	4.800
00935 POTASSIUM DISSOL (MG/L AS K)	175	30.000	0.080	1.613	2.300	1.700	1.400	1.200	0.900
00937 POTASSIUM TOTAL (MG/L AS K)	11	2.000	0.600	0.982	2.000	1.000	0.900	0.800	0.600
00940 CHLORIDE DISSOLV (MG/L AS CL)	185	16.000	0.010	6.148	8.570	7.000	6.100	5.300	3.830
00945 SULFATE DISSOLVE (MG/L AS SO4)	183	8.200	0.000	2.394	5.000	3.000	2.100	1.400	0.400
00950 FLUORIDE DISSOLV (MG/L AS F)	174	0.500	--	0.075*	*0.200	*0.100	*0.060	*0.039	*0.021
00955 SILICA DISSOLVED (MG/L AS SIO2)	184	17.000	3.300	9.831	12.000	11.000	10.000	9.125	5.900
01000 ARSENIC DISSOLVE (UG/L AS AS)	72	7.000	--	0.786*	*2.000	*1.000	*0.597	*0.378	*0.195
01001 ARSENIC SUSPENDE (UG/L AS AS)	30	3.000	--	0.870*	*2.450	*1.000	*0.722	*0.488	*0.274
01002 ARSENIC TOTAL (UG/L AS AS)	31	4.000	--	1.228*	*3.400	*1.000	*1.000	*0.654	*0.369

	DESCRIPTIVE STATISTICS				PERCENT OF SAMPLES IN WHICH VALUES WERE LESS THAN OR EQUAL TO THOSE SHOWN				
WATER-QUALITY CONSTITUENT	SAMPLE SIZE	MAXIMUM	MINIMUM	MEAN	95 %	75 %	(MEDIAN) 50 %	25 %	5 %
01005 BARIUM DISSOLVED (UG/L AS BA)	60	200.000	--	32.540*	*59.250	*31.827	*28.000	*23.000	*20.000
01006 BARIUM SUSPENDED (UG/L AS BA)	14	300.000	0.000	65.000	300.000	80.000	65.000	0.000	0.000
01007 BARIUM TOTAL (UG/L AS BA)	16	300.000	--	92.470*	*300.000	*100.000	*100.000	*22.250	*13.474
01010 BERYLLIUM DISSOL (UG/L AS BE)	37	--	--	--	--	--	--	--	--
01025 CADMIUM DISSOLVE (UG/L AS CD)	73	3.000	--	0.502*	*2.000	*0.618	*0.333	*0.181	*0.076
01026 CADMIUM SUSPENDE (UG/L AS CD)	20	--	--	--	--	--	--	--	--
01027 CADMIUM TOTAL (UG/L AS CD)	31	--	--	--	--	--	--	--	--
01030 CHROMIUM DISSOLV (UG/L AS CR)	68	10.000	--	1.192*	*10.000	*0.660	*0.155	*0.036	*0.005
01031 CHROMIUM SUSPEND (UG/L AS CR)	29	20.000	--	6.896*	*17.500	*10.000	*5.771	*4.286	*2.442
01032 CHROMIUM HEXAVAL (UG/L AS CR)	10	--	--	--	--	--	--	--	--
01034 CHROMIUM TOTAL (UG/L AS CR)	30	20.000	--	10.998*	*20.000	*13.179	*10.000	*8.268	*5.143
01035 COBALT DISSOLVED (UG/L AS CO)	72	3.000	--	1.608*	*3.000	*1.996	*1.613	*1.315	*0.985
01036 COBALT SUSPENDED (UG/L AS CO)	19	4.088	--	1.846*	*4.088	*2.399	*1.729	*1.000	*0.661
01037 COBALT TOTAL (UG/L AS CO)	31	3.000	--	1.569*	*3.000	*2.000	*1.329	*0.976	*0.661
01040 COPPER DISSOLVED (UG/L AS CU)	72	18.000	--	3.336*	*9.000	*5.000	*3.000	*1.198	*0.715
01041 COPPER SUSPENDED (UG/L AS CU)	27	6.000	0.000	1.667	5.200	3.000	1.000	0.000	0.000
01042 COPPER TOTAL (UG/L AS CU)	30	9.000	--	5.025*	*9.000	*6.250	*5.000	*3.000	*1.796
01044 IRON SUSPENDED (UG/L AS FE)	19	2000.000	140.000	658.947	2000.000	840.000	500.000	420.000	140.000
01045 IRON TOTAL (UG/L AS FE)	41	2100.000	250.000	748.537	1790.000	925.000	630.000	480.000	313.000
01046 IRON DISSOLVED (UG/L AS FE)	78	370.000	20.000	188.872	300.500	240.000	200.000	130.000	58.000
01049 LEAD DISSOLVED (UG/L AS PB)	72	9.000	--	1.931*	*5.000	*2.981	*1.291	*0.797	*0.364
01050 LEAD SUSPENDED (UG/L AS PB)	26	100.000	0.000	8.885	76.550	7.000	4.000	2.000	0.000
01051 LEAD TOTAL (UG/L AS PB)	31	33.000	--	6.510*	*21.000	*7.000	*5.000	*3.000	*1.600
01054 MANGANESE SUSPEN (UG/L AS MN)	30	140.000	0.000	39.900	134.500	52.500	32.500	10.000	0.000
01055 MANGANESE TOTAL (UG/L AS MN)	29	210.000	40.000	91.207	210.000	105.000	80.000	60.000	40.000
01056 MANGANESE DISSOL (UG/L AS MN)	74	170.000	10.000	57.041	120.000	66.750	50.000	40.000	30.000
01060 MOLYBDENUM DISSO (UG/L AS MO)	41	--	--	--	--	--	--	--	--
01065 NICKEL DISSOLVED (UG/L AS NI)	53	5.000	--	1.619*	*4.300	*3.000	*1.000	*0.602	*0.254
01066 NICKEL SUSPENDED (UG/L AS NI)	9	5.000	0.000	2.444	5.000	4.000	2.000	1.000	0.000
01067 NICKEL TOTAL (UG/L AS NI)	12	5.000	--	3.071*	*5.000	*4.750	*3.000	*2.000	*0.858
01075 SILVER DISSOLVED (UG/L AS AG)	60	1.000	--	1.000*	*1.000	*1.000	*1.000	*1.000	*1.000
01076 SILVER SUSPENDED (UG/L AS AG)	15	3.000	0.000	0.267	3.000	0.000	0.000	0.000	0.000
01077 SILVER TOTAL (UG/L AS AG)	22	--	--	--	--	--	--	--	--
01080 STRONTIUM DISSOL (UG/L AS SR)	41	28.000	9.000	20.707	24.000	23.000	21.000	19.000	14.200
01085 VANADIUM DISSOLV (UG/L AS V)	41	--	--	--	--	--	--	--	--
01090 ZINC DISSOLVED (UG/L AS ZN)	72	47.000	--	9.352*	*23.350	*11.000	*7.244	*4.902	*2.309
01091 ZINC SUSPENDED (UG/L AS ZN)	28	40.000	0.000	8.679	35.500	10.000	10.000	0.000	0.000
01092 ZINC TOTAL (UG/L AS ZN)	30	50.000	--	17.714*	*50.000	*20.000	*20.000	*9.924	*3.858
01106 ALUMINUM DISSOLV (UG/L AS AL)	41	150.000	--	48.159*	*140.000	*70.000	*40.000	*20.000	*8.445
01130 LITHIUM DISSOLVE (UG/L AS LI)	41	--	--	--	--	--	--	--	--

WATER-QUALITY CONSTITUENT	SAMPLE SIZE	MAXIMUM	MINIMUM	MEAN	95 %	75 %	(MEDIAN) 50 %	25 %	5 %
		DESCRIPTIVE STATISTICS			PERCENT OF SAMPLES IN WHICH VALUES WERE LESS THAN OR EQUAL TO THOSE SHOWN				
01145 SELENIUM DISSOLV (UG/L AS SE)	72	--	--	--	--	--	--	--	--
01146 SELENIUM SUSPEND (UG/L AS SE)	27	0.000	--	--	--	--	--	--	--
01147 SELENIUM TOTAL (UG/L AS SE)	31	--	--	--	--	--	--	--	--
31501 COLIFORM, TOTAL COLS./100 ML	2	5200.000	1500.000	--	--	--	--	--	--
31616 COLIFORM, FECAL COLS./100 ML	28	8800.000	12.000	781.893	5874.995	862.500	165.000	62.000	12.450
31625 COLIFORM FECAL 0 COLS./100 ML	118	38000.000	4.000	1140.407	4400.012	685.000	265.000	91.500	19.850
31673 FECAL STRPT KF A COLS./100 ML	116	60000.000	2.000	2147.604	13149.994	1150.000	265.000	90.000	19.400
31679 FECAL STRPT MF M COLS./100 ML	33	11000.000	12.000	1202.545	7430.016	1225.000	240.000	71.500	17.600
32226 CHLORO-B-PERI-SU MG/SQ M	1	1.700	--	--	--	--	--	--	--
32228 CHLORO-A-PERI-SU MG/SQ M	1	7.800	--	--	--	--	--	--	--
32730 PHENOLS, TOTAL UG/L	2	5000.000	5000.000	--	--	--	--	--	--
39025 SIMAZINE TOTAL-C UG/L	6	--	--	--	--	--	--	--	--
39034 PERTHANE TOTAL UG/L	2	--	--	--	--	--	--	--	--
39046 SIMAZINE BTM UG/KG	3	--	--	--	--	--	--	--	--
39250 PCN TOTAL (WA UG/L	2	--	--	--	--	--	--	--	--
39251 PCN TOTAL BTM DR UG/KG	2	--	--	--	--	--	--	--	--
39330 ALDRIN TOTAL (WA UG/L	15	--	--	--	--	--	--	--	--
39333 ALDRIN BTM U UG/KG	6	--	--	--	--	--	--	--	--
39340 LINDANE TOTAL(WA UG/L	15	--	--	--	--	--	--	--	--
39343 LINDANE BTM U UG/KG	5	--	--	--	--	--	--	--	--
39350 CHLORDANE TOT(WA UG/L	15	--	--	--	--	--	--	--	--
39351 CHLORDANE BTM U UG/KG	6	--	--	--	--	--	--	--	--
39360 DDD TOTAL (WA UG/L	15	--	--	--	--	--	--	--	--
39363 DDD BTM UG/KG	6	--	--	--	--	--	--	--	--
39365 DDE TOTAL (WA UG/L	15	--	--	--	--	--	--	--	--
39368 DDE BTM UG/KG	6	--	--	--	--	--	--	--	--
39370 DDT TOTAL (WA UG/L	15	--	--	--	--	--	--	--	--
39373 DDT BTM UG/KG	6	--	--	--	--	--	--	--	--
39380 DIELDRIN TOT (WA UG/L	15	--	--	--	--	--	--	--	--
39383 DIELDRIN BTM UG/KG	6	-	--	--	--	--	--	--	--
39388 ENDOSULFAN I TOT UG/L	2	--	--	--	--	--	--	--	--
39389 ENDOSULFANE BTM UG/KG	2	--	--	--	--	--	--	--	--
39390 ENDRIN UNF REC (UG/L)	15	--	--	--	--	--	--	--	--
39393 ENDRIN BTM UG/KG	6	--	--	--	--	--	--	--	--
39398 ETHION TOTAL (WA UG/L	13	--	--	--	--	--	--	--	--
39399 ETHION BTM UG/KG	4	--	--	--	--	--	--	--	--
39400 TOXAPHENE TOT(WA UG/L	14	--	--	--	--	--	--	--	--
39403 TOXAPHENE BTM UG/KG	5	--	--	--	--	--	--	--	--
39410 HEPTACHLOR T.(WA UG/L	15	--	--	--	--	--	--	--	--
39413 HEPTACHLOR BTM U UG/KG	6	--	--	--	--	--	--	--	--

WATER-QUALITY CONSTITUENT	SAMPLE SIZE	DESCRIPTIVE STATISTICS MAXIMUM	MINIMUM	MEAN	PERCENT OF SAMPLES IN WHICH VALUES WERE LESS THAN OR EQUAL TO THOSE SHOWN 95 %	75 %	(MEDIAN) 50 %	25 %	5 %
39420 HEPT EPOX TOT(WA UG/L	15	--	--	--	--	--	--	--	--
39423 HEPT EPOX BTM U UG/KG	6	--	--	--	--	--	--	--	--
39480 METHOXYCHLOR T.(UG/L	13	--	--	--	--	--	--	--	--
39481 MTHXYCLR BTM UG/ UG/KG	5	--	--	--	--	--	--	--	--
39504 PCB,54%CL, T (Al UG/L	1	0.100	--	--	--	--	--	--	--
39507 AROCLOR UG/KG	1	0.900	--	--	--	--	--	--	--
39516 PCB TOTAL (WA UG/L	9	--	--	--	--	--	--	--	--
39519 PCB BTM UG/KG	2	2.000	1.000	--	--	--	--	--	--
39530 MALATHION TOT(WA UG/L	15	--	--	--	--	--	--	--	--
39531 MALATHION BTM U UG/KG	4	--	--	--	--	--	--	--	--
39540 PARATHION TOT(WA UG/L	14	--	--	--	--	--	--	--	--
39541 PARATHION'BTM UG UG/KG	4	--	--	--	--	--	--	--	--
39570 DIAZINON TOT (WA UG/L	14	--	--	--	--	--	--	--	--
39571 DIAZINON BTM U UG/KG	3	--	--	--	--	--	--	--	--
39600 MET PARTH TOT(WA UG/L	14	--	--	--	--	--	--	--	--
39601 MET PARTH BTM U UG/KG	4	--	--	--	--	--	--	--	--
39630 ATRAZINE UNF REC (UG/L)	7	--	--	--	--	--	--	--	--
39631 ATRAZINE BTM UG/KG	3	--	--	--	--	--	--	--	--
39730 2,4-D TOTAL (WA UG/L	12	--	--	--	--	--	--	--	--
39731 2,4-D BTM UG/KG	3	--	--	--	--	--	--	--	--
39740 2,4,5-T TOTAL(WA UG/L	12	--	--	--	--	--	--	--	--
39741 2,4,5-T BTM UG/KG	3	--	--	--	--	--	--	--	--
39755 MIREX TOTAL UG/L	2	--	--	--	--	--	--	--	--
39758 MIREX BTM UG/KG	2	--	--	--	--	--	--	--	--
39760 SILVEX TOTAL (WA UG/L	12	--	--	--	--	--	--	--	--
39761 SILVEX BTM UG/KG	3	--	--	--	--	--	--	--	--
39786 ETH TRITH TOT(WA UG/L	13	--	--	--	--	--	--	--	--
39787 ETH TRITH BTM U UG/KG	4	--	--	--	--	--	--	--	--
39790 MET TRITH TOT(WA UG/L	13	--	--	--	--	--	--	--	--
39791 MET TRITH BTM U UG/KG	4	--	--	--	--	--	--	--	--
70300 RESIDUE DIS 180C MG/L	165	136.000	20.000	37.521	52.000	40.000	36.000	32.000	26.000
70301 DISSOLVED SOLIDS MG/L	163	104.000	14.000	32.411	39.000	34.000	33.000	30.000	23.000
70302 DISSOLVED SOLIDS TONS/DAY	161	2360.000	37.900	213.775	667.100	224.500	130.000	94.750	58.760
70303 RESIDUE DIS TON/ T/AC-FT	172	0.180	0.020	0.050	0.070	0.050	0.050	0.040	0.030
70331 SED-SUSP-SIEVE-. %	144	100.000	41.000	81.458	100.000	94.000	83.000	74.000	54.250
70507 PHOS ORTHO TOT A MG/L AS P	10	0.050	--	0.021*	*0.050	*0.023	*0.020	*0.010	*0.006
71845 NITROGEN, NH4, T MG/L AS NH4	102	0.530	0.000	0.091	0.216	0.130	0.080	0.040	0.010
71846 NITR. NH4 AS NH4 MG/L AS NH4	81	0.280	0.000	0.069	0.170	0.090	0.050	0.030	0.001
71850 N, NITRATE TOTAL MG/L AS NO3	13	0.930	0.200	0.556	0.930	0.800	0.500	0.350	0.200

WATER-QUALITY CONSTITUENT		SAMPLE SIZE	DESCRIPTIVE STATISTICS MAXIMUM	MINIMUM	MEAN	PERCENT OF SAMPLES IN WHICH VALUES WERE LESS THAN OR EQUAL TO THOSE SHOWN 95 %	75 %	(MEDIAN) 50 %	25 %	5 %
71851 NITR. NO3 AS NO3	MG/L AS NO3	23	1.700	0.000	0.394	1.560	0.500	0.300	0.030	0.002
71856 NITR. NO2 AS NO2	MG/L AS NO2	8	0.030	0.000	0.019	0.030	0.030	0.030	0.000	0.000
71885 IRON	UG/L AS FE	30	320.000	0.000	66.133	287.000	105.000	20.000	0.000	0.000
71886 PHOSPHORUS TOT P	MG/L AS PO4	50	1.300	0.030	0.249	0.830	0.280	0.180	0.120	0.063
71887 NITROGEN, TOTAL	MG/L AS NO3	84	17.000	1.200	3.942	8.225	4.575	3.400	2.500	1.800
71890 MERCURY DISSOLVE	UG/L AS HG	68	0.400	--	0.026*	*0.155	*0.021	*0.006	*0.002	*0.000
71895 MERCURY SUSPENDE	UG/L AS HG	28	0.200	0.000	0.032	0.155	0.100	0.000	0.000	0.000
71900 MERCURY, TOT.REC	UG/L AS HG	34	0.200	--	0.076*	*0.154	*0.100	*0.069	*0.052	*0.035
71999 SAMPLE, PURPOSE	PURPOSE CODE	12	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000
72000 ELEV.LSD(FT.AB.N	FT (NGVD)	260	44.300	44.300	44.300	44.300	44.300	44.300	44.300	44.300
75038 K40 TOTAL	PCI/L	6	1.300	0.800	1.067	1.300	1.225	1.100	0.875	0.800
80154 CONCENTRATION, S.	MG/L	147	1210.000	8.000	57.823	156.400	61.000	37.000	24.000	14.000
80155 DISCHARGE, SUSP.S	T/DAY	145	12100.000	21.000	531.214	2669.002	352.000	124.000	69.500	30.300
80164 SED-BED-SIEVE-.0	%	1	45.000	--	--	--	--	--	--	--
81886 PERTHANE, BOT.MA	UG/KG	2	--	--	--	--	--	--	--	--
82066 POTSSSIUM 40 DIS	(PCI/L AS K40)	28	1.900	0.700	1.068	1.855	1.175	1.000	0.900	0.700
82183 2, 4-DP	UG/L	2	--	--	--	--	--	--	--	--
82398 SAMPLING METHOD	METHOD, CODES	66	8010.000	10.000	7165.758	8010.000	8010.000	8010.000	8010.000	10.000
84164 SAMPLER TYPE COD	CODE	6	8010.000	8010.000	8010.000	8010.000	8010.000	8010.000	8010.000	8010.000
90095 SPECIFIC CONDUCT	MICROSIEMENS/C	90	74.000	30.000	43.100	50.900	45.000	43.000	40.000	32.550
90410 ALKALINITY	MG/L AS CACO3	77	14.000	3.000	8.381	11.100	9.700	9.000	7.000	5.000
95100 CONVERSION FACTO		60	67.500	1.800	15.433	41.175	18.850	12.900	8.475	3.655
95200 TOTAL COUNT	(CELLS/ML)	60	15000.000	47.000	1681.317	6519.995	2075.000	905.000	402.500	111.000
95410 ALKALINITY	MG/L AS CACO3	1	8.000	--	--	--	--	--	--	--
95902 HARDNESS, NONCAR	(MG/L AS CACO3	21	4.000	0.000	1.095	4.000	2.000	1.000	0.000	0.000
99430 CARBONATE ALKALI	MG/L	42	11.000	3.000	7.643	10.000	9.000	8.000	7.000	4.150
99440 BICARBONATE	MG/L AS HCO3	42	13.000	4.000	9.381	12.850	10.250	10.000	8.750	5.150
99445 CARBONATE	MG/L AS CO3	6	0.000	--	--	--	--	--	--	--
99890 SULFATE, D. UNCO	(MG/L)	4	--	--	--	--	--	--	--	--

* - VALUE IS ESTIMATED BY USING A LOG-PROBABILITY REGRESSION TO PREDICT THE VALUES OF DATA BELOW THE DETECTION LIMIT

STATION NUMBER: 02492600 STATION NAME: PEARL RIVER AT PEARL RIVER, LA DRAINAGE AREA: 8494 SQ MI

STATE: LOUISIANA COUNTY: ST TAMMANY LATITUDE/LONGITUDE: 302306 0894412

STATISTICAL SUMMARY OF SELECTED WATER QUALITY DATA COLLECTED FROM OCT 1963 TO SEPT 1964

		DESCRIPTIVE STATISTICS			PERCENT OF SAMPLES IN WHICH VALUES WERE LESS THAN OR EQUAL TO THOSE SHOWN				
WATER-QUALITY CONSTITUENT	SAMPLE SIZE	MAXIMUM	MINIMUM	MEAN	95 %	75 %	(MEDIAN) 50 %	25 %	5 %
00080 COLOR PLATINUM-COBAL	39	100.000	5.000	25.756	80.000	30.000	15.000	10.000	5.000
00095 SPECIFIC CONDUCT US/CM @ 25C	39	125.000	45.000	74.513	115.000	81.000	74.000	63.000	45.000
00400 PH, WH, FIELD (STANDARD UNIT	39	7.300	5.600	6.323	6.800	6.500	6.300	6.100	5.600
00440 BICARBONATE,WH,F (MG/L AS HCO3)	39	21.000	4.000	12.513	20.000	15.000	13.000	10.000	5.000
00445 CARBONATE,WH,FET (MG/L AS CO3)	39	0.000	--	--	--	--	--	--	--
00900 HARDNESS TOTAL (MG/L AS CACO3)	39	26.000	8.000	13.385	22.000	14.000	13.000	11.000	9.000
00902 NONCARBONATE HAR (MG/L AS CACO3	39	15.000	0.000	3.795	12.000	5.000	3.000	1.000	0.000
00916 CALCIUM TOTAL RE (MG/L AS CA)	39	7.000	2.000	3.377	5.900	4.000	3.100	2.500	2.000
00927 MAGNESIUM TOTAL (MG/L AS MG)	39	2.100	0.400	1.200	1.900	1.500	1.200	0.900	0.500
00929 SODIUM TOTAL REC ((MG/L AS NA)	39	15.000	2.300	8.223	14.000	11.000	7.800	6.400	3.000
00937 POTASSIUM TOTAL (MG/L AS K)	39	2.100	0.900	1.477	1.800	1.600	1.500	1.300	1.100
00940 CHLORIDE DISSOLV (MG/L AS CL)	39	24.000	3.600	9.446	19.000	11.000	8.900	6.600	3.600
00945 SULFATE DISSOLVE (MG/L AS SO4)	39	17.000	3.200	8.390	16.000	9.700	7.600	6.400	4.200
00951 FLUORIDE TOTAL (MG/L AS F)	39	0.400	0.000	0.079	0.100	0.100	0.100	0.000	0.000
00955 SILICA DISSOLVED (MG/L AS SIO2)	39	16.000	6.000	10.049	15.000	11.000	10.000	8.600	6.500
70300 RESIDUE DIS 180C MG/L	37	88.000	47.000	62.405	79.000	68.000	62.000	55.500	48.800
71850 N, NITRATE TOTAL MG/L AS NO3	37	4.700	0.100	0.654	1.730	0.800	0.400	0.300	0.190
71885 IRON UG/L AS FE	39	440.000	0.000	81.795	280.000	130.000	20.000	10.000	0.000

STATION NUMBER: 301500089572000 STATION NAME: L PONTCHARTRAIN AT MOUTH OF BYU LACOMBE DRAINAGE AREA: -999999 SQ MI

STATE: LOUISIANA COUNTY: ST TAMMANY LATITUDE/LONGITUDE: 301500 0895720

STATISTICAL SUMMARY OF SELECTED WATER QUALITY DATA COLLECTED FROM JUN 1974 TO JAN 1981

WATER-QUALITY CONSTITUENT		SAMPLE SIZE	DESCRIPTIVE STATISTICS MAXIMUM	MINIMUM	MEAN	PERCENT OF SAMPLES IN WHICH VALUES WERE LESS THAN OR EQUAL TO THOSE SHOWN 95 %	75 %	(MEDIAN) 50 %	25 %	5 %
00010 WATER TEMPERATUR	(DEGREES)	44	30.500	8.000	20.739	30.250	25.000	21.750	16.500	10.000
00070 TURBIDITY	(JCU)	147	70.000	2.000	11.224	30.000	15.000	10.000	5.000	2.000
00075 TURBIDITY (MG/L)	(MG/L AS SIO2)	8	32.000	5.000	19.625	32.000	31.500	17.500	10.750	5.000
00076 TURBIDITY	(NTU)	4	5.000	1.000	--	--	--	--	--	--
00080 COLOR	PLATINUM-COBAL	158	130.000	0.000	26.772	80.000	30.000	20.000	10.000	5.000
00095 SPECIFIC CONDUCT	US/CM @ 25C	158	10100.000	82.000	3540.126	8936.996	4880.000	3075.000	1447.500	977.100
00300 OXYGEN DISSOLVED	(MG/L)	157	14.200	3.900	8.270	10.910	9.200	8.100	7.450	5.380
00310 BOD 5-DAY AT 20	(MG/L)	152	7.300	0.000	1.739	4.000	2.200	1.400	0.900	0.400
00340 COD HIGH LEVEL M	(MG/L)	99	350.000	9.000	50.414	140.000	55.000	35.000	24.000	16.000
00400 PH, WH, FIELD	(STANDARD UNIT	159	8.300	6.000	7.344	7.900	7.600	7.400	7.100	6.600
00403 PH, WH, LABORATO	(STANDARD UNIT	4	7.600	7.500	--	--	--	--	--	--
00405 CARBON DIOXIDE D	(MG/L AS CO2)	155	29.000	0.500	3.930	10.000	5.100	2.700	1.900	1.060
00410 ALKALINITY,WH,FE	(MG/L AS CACO3	159	170.000	6.000	35.780	54.000	41.000	35.000	28.000	17.000
00440 BICARBONATE,WH,F	(MG/L AS HCO3)	155	96.000	7.000	42.355	66.000	50.000	42.000	34.000	20.000
00445 CARBONATE,WH,FET	(MG/L AS CO3)	155	0.000	--	--	--	--	--	--	--
00500 RESIDUE SOLIDS	(MG/L)	1	24.000	--	--	--	--	--	--	--
00530 RESIDUE TOTAL	(MG/L)	87	178.000	0.000	18.230	59.600	19.000	12.000	7.000	1.800
00550 OIL AND GREASE T	(MG/L)	8	60.000	0.000	0.750	60.000	3.750	1.000	0.250	0.000
00556 OIL AND GREASE R	(MG/L)	121	51.000	0.000	0.929	2.900	0.000	0.000	0.000	0.000
00600 NITROGEN TOTAL	(MG/L AS N)	4	2.000	0.340	--	--	--	--	--	--
00615 NITROGEN,NITRITE	MG/L AS N	148	0.120	--	0.015*	*0.035	*0.020	*0.010	*0.007	*0.003
00618 NITROGEN NITRATE	(MG/L AS N)	2	0.060	0.050	--	--	--	--	--	--
00620 NITROGEN NITRATE	MG/L AS N	154	1.580	0.000	0.115	0.697	0.120	0.030	0.010	0.000
00623 NITRO AMN & ORG	(MG/L AS N)	107	1.400	0.090	0.562	0.996	0.650	0.520	0.430	0.288
00625 NITROGEN AMM+ORG	(MG/L AS N)	3	0.820	0.340	--	--	--	--	--	--
00630 NO2 + NO3 TOTAL	(MG/L AS N)	148	1.600	--	0.131*	*0.765	*0.127	*0.049	*0.020	*0.010
00650 PHOSPHATE TOTAL	(MG/L AS PO4)	45	0.250	0.030	0.114	0.210	0.135	0.120	0.090	0.060

WATER-QUALITY CONSTITUENT	SAMPLE SIZE	DESCRIPTIVE STATISTICS MAXIMUM	MINIMUM	MEAN	PERCENT OF SAMPLES IN WHICH VALUES WERE LESS THAN OR EQUAL TO THOSE SHOWN 95 %	75 %	(MEDIAN) 50 %	25 %	5 %
00665 PHOSPHORUS TOTAL (MG/L AS P)	156	2.500	0.010	0.087	0.243	0.060	0.040	0.030	0.020
00680 CARBON ORGANIC T (MG/L AS C)	147	28.000	2.300	8.766	17.600	10.000	7.600	6.200	4.940
00720 CYANIDE TOTAL (MG/L AS CN)	155	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000
00900 HARDNESS TOTAL (MG/L AS CACO3)	153	1100.000	25.000	366.523	956.000	475.000	300.000	165.000	75.800
00902 NONCARBONATE HAR (MG/L AS CACO3	153	1100.000	17.000	331.595	923.000	440.000	270.000	130.000	58.400
00915 CALCIUM DISSOLVE (MG/L AS CA)	144	83.000	3.100	30.901	68.000	38.000	28.000	20.000	7.700
00925 MAGNESIUM DISSOL (MG/L AS MG)	144	220.000	4.200	69.653	190.000	90.000	57.500	26.000	12.000
00930 SODIUM DISSOLVED (MG/L AS NA)	80	1800.000	50.000	511.025	1495.000	680.000	355.000	200.000	140.500
00931 SODIUM ADSORPTIO (RATIO)	80	24.000	3.000	11.250	21.900	14.000	10.000	7.000	5.050
00932 SODIUM, PERCENT PERCENT	80	78.000	65.000	74.313	77.000	76.000	75.000	73.000	68.000
00933 SODIUM+POTASSIUM (MG/L AS NA)	42	1100.000	150.000	399.048	992.500	530.000	285.000	220.000	161.500
00935 POTASSIUM DISSOL (MG/L AS K)	80	71.000	3.300	23.375	58.900	35.000	17.500	11.000	6.930
00940 CHLORIDE DISSOLV (MG/L AS CL)	156	3400.000	60.000	1047.910	2915.000	1400.000	875.000	385.000	238.500
00945 SULFATE DISSOLVE (MG/L AS SO4)	156	450.000	11.000	151.032	381.500	197.500	130.000	70.000	25.000
00950 FLUORIDE DISSOLV (MG/L AS F)	1	0.200	--	--	--	--	--	--	--
01000 ARSENIC DISSOLVE (UG/L AS AS)	157	3.000	--	0.964*	*1.000	*1.000	*1.000	*0.846	*0.725
01001 ARSENIC SUSPENDE (UG/L AS AS)	149	3.000	--	0.818*	*1.000	*1.000	*0.770	*0.670	*0.454
01002 ARSENIC TOTAL (UG/L AS AS)	156	9.000	--	1.163*	*2.000	*1.000	*1.000	*1.000	*0.634
01010 BERYLLIUM DISSOL (UG/L AS BE)	94	10.000	--	0.550*	*2.263	*0.395	*0.115	*0.033	*0.006
01011 BERYLLIUM SUSPEN (UG/L AS BE)	89	10.000	0.000	0.899	10.000	0.000	0.000	0.000	0.000
01012 BERYLLIUM TOTAL (UG/L AS BE)	93	10.000	--	2.512*	*10.000	*3.008	*1.476	*0.790	*0.288
01025 CADMIUM DISSOLVE (UG/L AS CD)	153	5.000	--	0.781*	*2.000	*1.000	*0.637	*0.412	*0.226
01026 CADMIUM SUSPENDE (UG/L AS CD)	143	12.000	0.000	0.580	3.000	1.000	0.000	0.000	0.000
01027 CADMIUM TOTAL (UG/L AS CD)	156	18.000	--	1.439*	*4.000	*1.678	*1.000	*0.611	*0.286
01030 CHROMIUM DISSOLV (UG/L AS CR)	1	--	--	--	--	--	--	--	--
01032 CHROMIUM HEXAVAL (UG/L AS CR)	156	3.000	0.000	0.038	0.000	0.000	0.000	0.000	0.000
01034 CHROMIUM TOTAL (UG/L AS CR)	156	60.000	--	12.538*	*20.000	*15.055	*11.479	*8.764	*5.855
01040 COPPER DISSOLVED (UG/L AS CU)	108	9.000	--	2.177*	*5.000	*3.000	*2.000	*1.120	*0.661
01041 COPPER SUSPENDED (UG/L AS CU)	108	34.000	0.000	2.117	8.000	3.000	2.000	0.000	0.000
01042 COPPER TOTAL (UG/L AS CU)	108	35.000	--	4.385*	*9.000	*5.000	*4.000	*2.250	*1.342
01046 IRON DISSOLVED (UG/L AS FE)	157	330.000	--	56.433*	*230.000	*70.000	*30.000	*10.056	*2.918
01049 LEAD DISSOLVED (UG/L AS PB)	157	12.000	--	1.294*	*3.000	*1.578	*0.967	*0.572	*0.270
01050 LEAD SUSPENDED (UG/L AS PB)	147	120.000	0.000	6.184	25.400	6.000	3.000	0.000	0.000
01051 LEAD TOTAL (UG/L AS PB)	154	120.000	--	6.229*	*20.000	*6.000	*3.000	*1.505	*0.526
01065 NICKEL DISSOLVED (UG/L AS NI)	108	6.000	--	1.898*	*4.000	*2.000	*1.593	*1.058	*0.601
01066 NICKEL SUSPENDED (UG/L AS NI)	104	48.000	0.000	2.981	7.000	4.000	2.000	0.000	0.000
01067 NICKEL TOTAL (UG/L AS NI)	108	22.000	--	3.915*	*7.550	*4.817	*3.732	*2.859	*1.718
01085 VANADIUM DISSOLV (UG/L AS V)	1	1.000	--	--	--	--	--	--	--
01090 ZINC DISSOLVED (UG/L AS ZN)	157	40.000	--	9.062*	*20.000	*10.968	*7.000	*3.987	*1.897
01091 ZINC SUSPENDED (UG/L AS ZN)	148	150.000	0.000	10.392	35.500	20.000	10.000	0.000	0.000

WATER-QUALITY CONSTITUENT	SAMPLE SIZE	MAXIMUM	MINIMUM	MEAN	95 %	75 %	(MEDIAN) 50 %	25 %	5 %
	DESCRIPTIVE STATISTICS				PERCENT OF SAMPLES IN WHICH VALUES WERE LESS THAN OR EQUAL TO THOSE SHOWN				
01092 ZINC TOTAL (UG/L AS ZN)	155	170.000	--	20.318*	*50.000	*20.000	*20.000	*11.266	*6.365
01145 SELENIUM DISSOLV (UG/L AS SE)	94	1.000	--	1.000*	*1.000	*1.000	*1.000	*1.000	*1.000
01146 SELENIUM SUSPEND (UG/L AS SE)	94	1.000	0.000	0.053	1.000	0.000	0.000	0.000	0.000
01147 SELENIUM TOTAL (UG/L AS SE)	94	1.000	--	1.000*	*1.000	*1.000	*1.000	*1.000	*1.000
31501 COLIFORM, TOTAL COLS./100 ML	149	3400.000	--	295.344*	*1400.000	*365.000	*83.000	*12.000	*2.103
31616 COLIFORM, FECAL COLS./100 ML	62	2500.000	--	132.107*	*499.000	*132.500	*53.000	*10.787	*2.662
31625 COLIFORM FECAL 0 COLS./100 ML	93	680.000	--	28.308*	*136.000	*16.000	*2.000	*0.395	*0.045
32226 CHLORO-B-PERI-SU MG/SQ M	1	0.100	--	--	--	--	--	--	--
32228 CHLORO-A-PERI-SU MG/SQ M	1	0.100	--	--	--	--	--	--	--
32230 CHLORO-A-PHY-SUC UG/L	2	0.500	0.000	--	--	--	--	--	--
32231 CHLORO-B-PHY-S UG/L	2	0.000	--	--	--	--	--	--	--
32730 PHENOLS, TOTAL UG/L	155	16.000	0.000	1.065	6.200	2.000	1.000	0.000	0.000
39034 PERTHANE TOTAL UG/L	79	0.000	--	--	--	--	--	--	--
39250 PCN TOTAL (WA UG/L	146	0.100	0.000	0.001	0.000	0.000	0.000	0.000	0.000
39330 ALDRIN TOTAL (WA UG/L	150	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
39340 LINDANE TOTAL(WA UG/L	150	0.002	0.000	0.000	0.001	0.000	0.000	0.000	0.000
39350 CHLORDANE TOT(WA UG/L	150	0.100	0.000	0.001	0.000	0.000	0.000	0.000	0.000
39360 DDD TOTAL (WA UG/L	150	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
39365 DDE TOTAL (WA UG/L	150	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
39370 DDT TOTAL (WA UG/L	150	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
39380 DIELDRIN TOT (WA UG/L	150	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000
39388 ENDOSULFAN I TOT UG/L	80	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
39390 ENDRIN UNF REC (UG/L)	150	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
39398 ETHION TOTAL (WA UG/L	116	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000
39400 TOXAPHENE TOT(WA UG/L	150	0.100	0.000	0.001	0.000	0.000	0.000	0.000	0.000
39410 HEPTACHLOR T.(WA UG/L	150	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
39420 HEPT EPOX TOT(WA UG/L	150	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
39480 METHOXYCHLOR T.(UG/L	80	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000
39516 PCB TOTAL (WA UG/L	150	0.100	0.000	0.003	0.000	0.000	0.000	0.000	0.000
39530 MALATHION TOT(WA UG/L	116	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000
39540 PARATHION TOT(WA UG/L	116	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000
39570 DIAZINON TOT (WA UG/L	116	0.020	0.000	0.003	0.010	0.010	0.000	0.000	0.000
39600 MET PARTH TOT(WA UG/L	116	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000
39730 2,4-D TOTAL (WA UG/L	76	0.310	0.000	0.031	0.212	0.030	0.020	0.000	0.000
39740 2,4,5-T TOTAL(WA UG/L	76	0.030	0.000	0.004	0.010	0.010	0.000	0.000	0.000
39755 MIREX TOTAL UG/L	86	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000
39760 SILVEX TOTAL (WA UG/L	77	0.000	--	--	--	--	--	--	--
39786 ETH TRITH TOT(WA UG/L	116	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000
39790 MET TRITH TOT(WA UG/L	115	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50086 SETTLEABLE MATTE ML/L/HR	109	--	--	--	--	--	--	--	--

WATER-QUALITY CONSTITUENT	SAMPLE SIZE	MAXIMUM	MINIMUM	MEAN	95 %	75 %	(MEDIAN) 50 %	25 %	5 %
	DESCRIPTIVE STATISTICS				PERCENT OF SAMPLES IN WHICH VALUES WERE LESS THAN OR EQUAL TO THOSE SHOWN				
70299 RESIDUE SUSPEN 1 MG/L	67	322.000	0.000	22.746	81.400	22.000	13.000	6.000	0.000
70951 CHLORO-A PHYTO C UG/L	3	1.060	0.500	--	--	--	--	--	--
70952 CHLORO-B PHYTO C UG/L	3	0.351	0.069	--	--	--	--	--	--
70953 CHL-A PHY CHROMA UG/L	89	37.900	0.000	8.726	29.950	10.950	5.930	3.555	0.086
70954 CHLOROPHYLL-B, P UG/L	89	7.970	0.000	0.289	1.162	0.000	0.000	0.000	0.000
71850 N, NITRATE TOTAL MG/L AS NO3	6	0.810	0.270	0.515	0.810	0.697	0.480	0.360	0.270
71851 NITR. NO3 AS NO3 MG/L AS NO3	2	0.260	0.240	--	--	--	--	--	--
71886 PHOSPHORUS TOT P MG/L AS PO4	65	0.550	0.030	0.121	0.238	0.135	0.090	0.090	0.060
71887 NITROGEN, TOTAL MG/L AS NO3	3	3.600	1.500	--	--	--	--	--	--
71890 MERCURY DISSOLVE UG/L AS HG	157	--	--	***********	--	--	--	--	--
71895 MERCURY SUSPENDE UG/L AS HG	146	1.400	0.000	0.040	0.100	0.000	0.000	0.000	0.000
71900 MERCURY, TOT.REC UG/L AS HG	153	1.400	--	0.052*	*0.235	*0.035	*0.010	*0.003	*0.000
82068 POTSSSIUM 40 DIS (PCI/L AS K40)	68	52.000	1.900	13.272	39.400	18.000	8.600	7.200	2.735
82183 2, 4-DP UG/L	66	0.000	--	--	--	--	--	--	--
90095 SPECIFIC CONDUCT MICROSIEMENS/C	4	10600.000	7150.000	--	--	--	--	--	--
90410 ALKALINITY MG/L AS CACO3	4	47.000	35.000	--	--	--	--	--	--

* - VALUE IS ESTIMATED BY USING A LOG-PROBABILITY REGRESSION TO PREDICT THE VALUES OF DATA BELOW THE DETECTION LIMIT

STATION NUMBER: 301300089493000 STATION NAME: LAKE PONTCHARTRAIN AT NORTH SHORE DRAINAGE AREA: -999999 SQ MI

STATE: LOUISIANA COUNTY: ST TAMMANY LATITUDE/LONGITUDE: 301300 0894930

STATISTICAL SUMMARY OF SELECTED WATER QUALITY DATA COLLECTED FROM APR 1974 TO JUL 1984

WATER-QUALITY CONSTITUENT		SAMPLE SIZE	DESCRIPTIVE STATISTICS MAXIMUM	MINIMUM	MEAN	PERCENT OF SAMPLES IN WHICH VALUES WERE LESS THAN OR EQUAL TO THOSE SHOWN 95 %	75 %	(MEDIAN) 50 %	25 %	5 %
00010 WATER TEMPERATUR	(DEGREES)	21	30.500	6.000	21.619	30.500	27.000	21.500	19.500	6.250
00070 TURBIDITY	(JCU)	13	50.000	3.000	10.692	50.000	10.000	6.000	4.500	3.000
00076 TURBIDITY	(NTU)	14	25.000	3.000	11.143	25.000	20.000	6.500	4.000	3.000
00080 COLOR	PLATINUM-COBAL	27	50.000	5.000	14.815	44.000	20.000	15.000	5.000	5.000
00095 SPECIFIC CONDUCT	US/CM @ 25C	27	14500.000	410.000	5393.111	14099.998	9110.000	3750.000	2680.000	639.600
00300 OXYGEN DISSOLVED	(MG/L)	27	12.300	5.800	8.785	12.260	9.600	8.700	7.500	5.840
00310 BOD 5-DAY AT 20	(MG/L)	26	4.100	0.300	1.377	3.645	1.600	1.200	0.875	0.405
00340 COD HIGH LEVEL M	(MG/L)	14	430.000	10.000	137.429	430.000	205.000	85.500	40.750	10.000
00400 PH, WH, FIELD	(STANDARD UNIT	27	8.600	6.700	7.485	8.480	7.700	7.400	7.300	6.860
00403 PH, WH, LABORATO	(STANDARD UNIT	14	7.800	6.900	7.329	7.800	7.500	7.350	7.100	6.900
00405 CARBON DIOXIDE D	(MG/L AS CO2)	12	5.700	0.200	2.783	5.700	4.075	3.150	1.275	0.200
00410 ALKALINITY,WH,FE	(MG/L AS CACO3	26	75.000	27.000	43.385	71.500	48.750	40.500	35.000	27.350
00440 BICARBONATE,WH,F	(MG/L AS HCO3)	12	68.000	38.000	52.000	68.000	61.750	51.500	43.000	38.000
00445 CARBONATE,WH,FET	(MG/L AS CO3)	13	0.000	--	--	--	--	--	--	--
00530 RESIDUE TOTAL	(MG/L)	14	39.000	6.000	17.500	39.000	26.750	12.000	9.750	6.000
00556 OIL AND GREASE R	(MG/L)	26	--	--	--	--	--	--	--	--
00615 NITROGEN,NITRITE	MG/L AS N	26	0.030	--	0.010*	*0.027	*0.012	*0.010	*0.005	*0.003
00620 NITROGEN NITRATE	MG/L AS N	21	0.580	--	0.132*	*0.560	*0.200	*0.050	*0.013	*0.004
00623 NITRO AMN & ORG	(MG/L AS N)	13	0.800	0.200	0.475	0.800	0.600	0.500	0.300	0.200
00630 NO2 + NO3 TOTAL	(MG/L AS N)	26	0.600	--	0.124*	*0.527	*0.185	*0.057	*0.025	*0.009
00665 PHOSPHORUS TOTAL	(MG/L AS P)	26	0.100	0.010	0.044	0.097	0.050	0.040	0.030	0.013
00680 CARBON ORGANIC T	(MG/L AS C)	25	21.000	3.000	7.516	20.700	8.500	6.500	5.050	3.270
00720 CYANIDE TOTAL	(MG/L AS CN)	26	--	--	--	--	--	--	--	--
00900 HARDNESS TOTAL	(MG/L AS CACO3)	26	1600.000	100.000	599.615	1495.000	1100.000	380.000	287.500	128.000
00902 NONCARBONATE HAR	(MG/L AS CACO3	20	1600.000	130.000	624.000	1585.000	1100.000	405.000	262.500	132.500
00915 CALCIUM DISSOLVE	(MG/L AS CA)	26	110.000	21.000	48.192	106.500	75.250	35.500	27.750	21.350
00925 MAGNESIUM DISSOL	(MG/L AS MG)	26	330.000	10.000	117.577	309.000	220.000	73.000	53.750	17.000

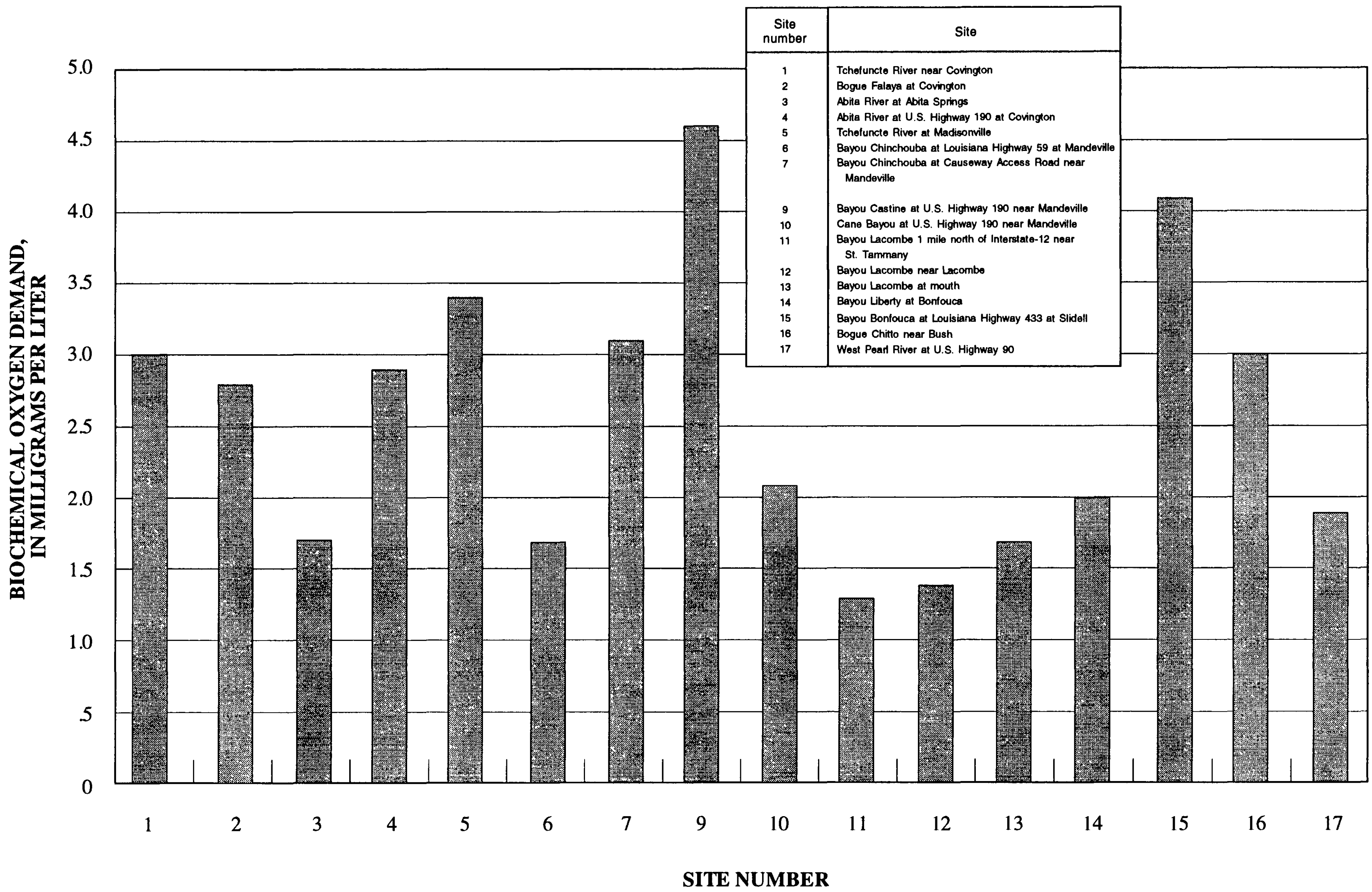
WATER-QUALITY CONSTITUENT		SAMPLE SIZE	DESCRIPTIVE STATISTICS MAXIMUM	MINIMUM	MEAN	PERCENT OF SAMPLES IN WHICH VALUES WERE LESS THAN OR EQUAL TO THOSE SHOWN 95 %	75 %	(MEDIAN) 50 %	25 %	5 %
00930 SODIUM DISSOLVED	(MG/L AS NA)	14	2700.000	45.000	1326.072	2700.000	1950.000	1600.000	450.000	45.000
00931 SODIUM ADSORPTIO	(RATIO)	14	29.000	2.000	18.643	29.000	24.500	22.000	11.750	2.000
00932 SODIUM, PERCENT	PERCENT	14	79.000	47.000	74.429	79.000	77.000	77.000	75.000	47.000
00935 POTASSIUM DISSOL	(MG/L AS K)	14	110.000	4.200	48.729	110.000	70.500	55.500	18.000	4.200
00940 CHLORIDE DISSOLV	(MG/L AS CL)	26	5100.000	65.000	1742.885	4785.001	1150.000	1100.000	777.500	187.250
00945 SULFATE DISSOLVE	(MG/L AS SO4)	26	650.000	35.000	252.731	615.000	452.500	155.000	120.000	46.200
01000 ARSENIC DISSOLVE	(UG/L AS AS)	26	1.000	--	1.000*	*1.000	*1.000	*1.000	*1.000	*1.000
01001 ARSENIC SUSPENDE	(UG/L AS AS)	22	1.000	--	1.000*	*1.000	*1.000	*1.000	*1.000	*1.000
01002 ARSENIC TOTAL	(UG/L AS AS)	26	2.000	--	1.076*	*2.000	*1.000	*1.000	*1.000	*0.697
01010 BERYLLIUM DISSOL	(UG/L AS BE)	14	--	--	--	--	--	--	--	--
01011 BERYLLIUM SUSPEN	(UG/L AS BE)	2	10.000	0.000	--	--	--	--	--	--
01012 BERYLLIUM TOTAL	(UG/L AS BE)	14	--	--	--	--	--	--	--	--
01025 CADMIUM DISSOLVE	(UG/L AS CD)	26	3.000	--	0.899*	*3.000	*1.000	*0.600	*0.317	*0.124
01026 CADMIUM SUSPENDE	(UG/L AS CD)	19	3.000	0.000	0.421	3.000	1.000	0.000	0.000	0.000
01027 CADMIUM TOTAL	(UG/L AS CD)	26	3.000	--	1.230*	*3.000	*1.344	*1.000	*0.823	*0.471
01032 CHROMIUM HEXAVAL	(UG/L AS CR)	25	--	--	--	--	--	--	--	--
01034 CHROMIUM TOTAL	(UG/L AS CR)	26	20.000	--	14.320*	*20.000	*20.000	*13.114	*10.000	*8.038
01040 COPPER DISSOLVED	(UG/L AS CU)	14	11.000	1.000	4.714	11.000	5.250	3.500	2.750	1.000
01041 COPPER SUSPENDED	(UG/L AS CU)	13	6.000	0.000	2.385	6.000	4.000	2.000	0.000	0.000
01042 COPPER TOTAL	(UG/L AS CU)	14	11.000	2.000	6.357	11.000	9.000	6.000	4.000	2.000
01046 IRON DISSOLVED	(UG/L AS FE)	26	140.000	--	43.178*	*133.000	*62.500	*30.000	*10.000	*4.494
01049 LEAD DISSOLVED	(UG/L AS PB)	26	27.000	--	2.522*	*18.950	*3.000	*1.066	*0.711	*0.234
01050 LEAD SUSPENDED	(UG/L AS PB)	23	29.000	0.000	5.565	27.200	5.000	4.000	1.000	0.000
01051 LEAD TOTAL	(UG/L AS PB)	26	30.000	--	7.662*	*30.000	*8.000	*6.000	*1.999	*0.808
01065 NICKEL DISSOLVED	(UG/L AS NI)	14	4.000	--	2.487*	*4.000	*3.250	*2.500	*1.750	*0.812
01066 NICKEL SUSPENDED	(UG/L AS NI)	12	8.000	0.000	2.083	8.000	3.750	1.000	0.000	0.000
01067 NICKEL TOTAL	(UG/L AS NI)	14	10.000	1.000	4.500	10.000	6.000	4.000	3.000	1.000
01085 VANADIUM DISSOLV	(UG/L AS V)	3	76.000	2.000	--	--	--	--	--	--
01090 ZINC DISSOLVED	(UG/L AS ZN)	26	30.000	--	10.888*	*30.000	*20.000	*9.500	*2.285	*1.015
01091 ZINC SUSPENDED	(UG/L AS ZN)	24	280.000	0.000	24.208	222.500	20.000	10.000	8.250	0.000
01092 ZINC TOTAL	(UG/L AS ZN)	25	290.000	--	32.781*	*277.000	*30.000	*20.000	*6.591	*2.574
01145 SELENIUM DISSOLV	(UG/L AS SE)	14	--	--	--	--	--	--	--	--
01146 SELENIUM SUSPEND	(UG/L AS SE)	2	0.000	--	--	--	--	--	--	--
01147 SELENIUM TOTAL	(UG/L AS SE)	14	--	--	--	--	--	--	--	--
31501 COLIFORM, TOTAL	COLS./100 ML	26	9600.000	--	683.929*	*7223.011	*380.000	*100.000	*23.000	*1.856
31616 COLIFORM, FECAL	COLS./100 ML	13	350.000	--	62.760*	*350.000	*90.000	*7.100	*2.384	*0.378
31625 COLIFORM FECAL 0	COLS./100 ML	12	100.000	--	27.538*	*100.000	*55.000	*8.000	*3.500	*0.726
32730 PHENOLS, TOTAL	UG/L	26	6.000	--	0.832*	*5.300	*1.000	*0.285	*0.095	*0.020
39570 DIAZINON TOT (WA	UG/L	14	0.130	--	0.020*	*0.130	*0.020	*0.010	*0.003	*0.001
39600 MET PARTH TOT(WA	UG/L	14	--	--	--	--	--	--	--	--
39730 2,4-D TOTAL (WA	UG/L	14	0.200	--	0.031*	*0.200	*0.030	*0.020	*0.009	*0.002
50086 SETTLEABLE MATTE	ML/L/HR	11	--	--	--	--	--	--	--	--
70299 RESIDUE SUSPEN 1	MG/L	12	42.000	0.000	16.500	42.000	22.500	16.000	5.000	0.000
70953 CHL-A PHY CHROMA	UG/L	14	25.000	--	5.039*	*25.000	*6.725	*3.075	*1.227	*0.262
71886 PHOSPHORUS TOT P	MG/L AS PO4	13	0.310	0.060	0.156	0.310	0.195	0.150	0.090	0.060

WATER-QUALITY CONSTITUENT	SAMPLE SIZE	MAXIMUM	MINIMUM	MEAN	95 %	75 %	(MEDIAN) 50 %	25 %	5 %
	DESCRIPTIVE STATISTICS				PERCENT OF SAMPLES IN WHICH VALUES WERE LESS THAN OR EQUAL TO THOSE SHOWN				
71890 MERCURY DISSOLVE UG/L AS HG	26	0.600	--	0.149*	*0.565	*0.202	*0.095	*0.050	*0.022
71895 MERCURY SUSPENDE UG/L AS HG	17	0.500	0.000	0.053	0.500	0.100	0.000	0.000	0.000
71900 MERCURY, TOT.REC UG/L AS HG	26	0.600	--	0.172*	*0.565	*0.231	*0.101	*0.060	*0.078
82068 POTSSSIUM 40 DIS (PCI/L AS K40)	1	43.000	--	--	--	--	--	--	--
90095 SPECIFIC CONDUCT MICROSIEMENS/C	14	14900.000	438.000	6880.214	14900.000	10875.000	6400.000	2755.000	438.000
90410 ALKALINITY MG/L AS CACO3	14	73.000	20.000	44.643	73.000	60.500	40.000	30.750	20.000
95902 HARDNESS, NONCAR (MG/L AS CACO3	8	1500.000	260.000	1075.000	1500.000	1300.000	1150.000	905.000	260.000

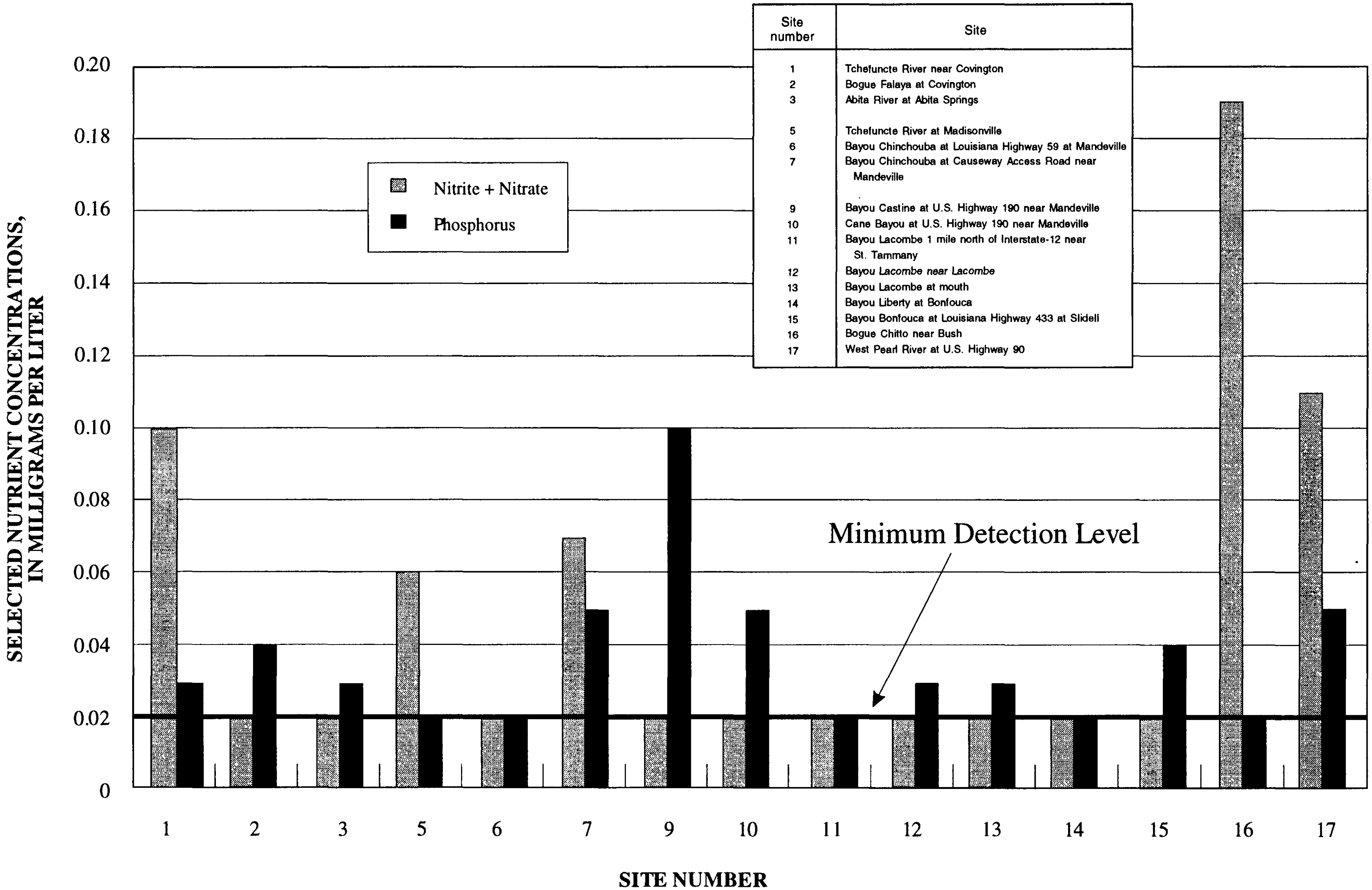
* - VALUE IS ESTIMATED BY USING A LOG-PROBABILITY REGRESSION TO PREDICT THE VALUES OF DATA BELOW THE DETECTION LIMIT

Appendix B

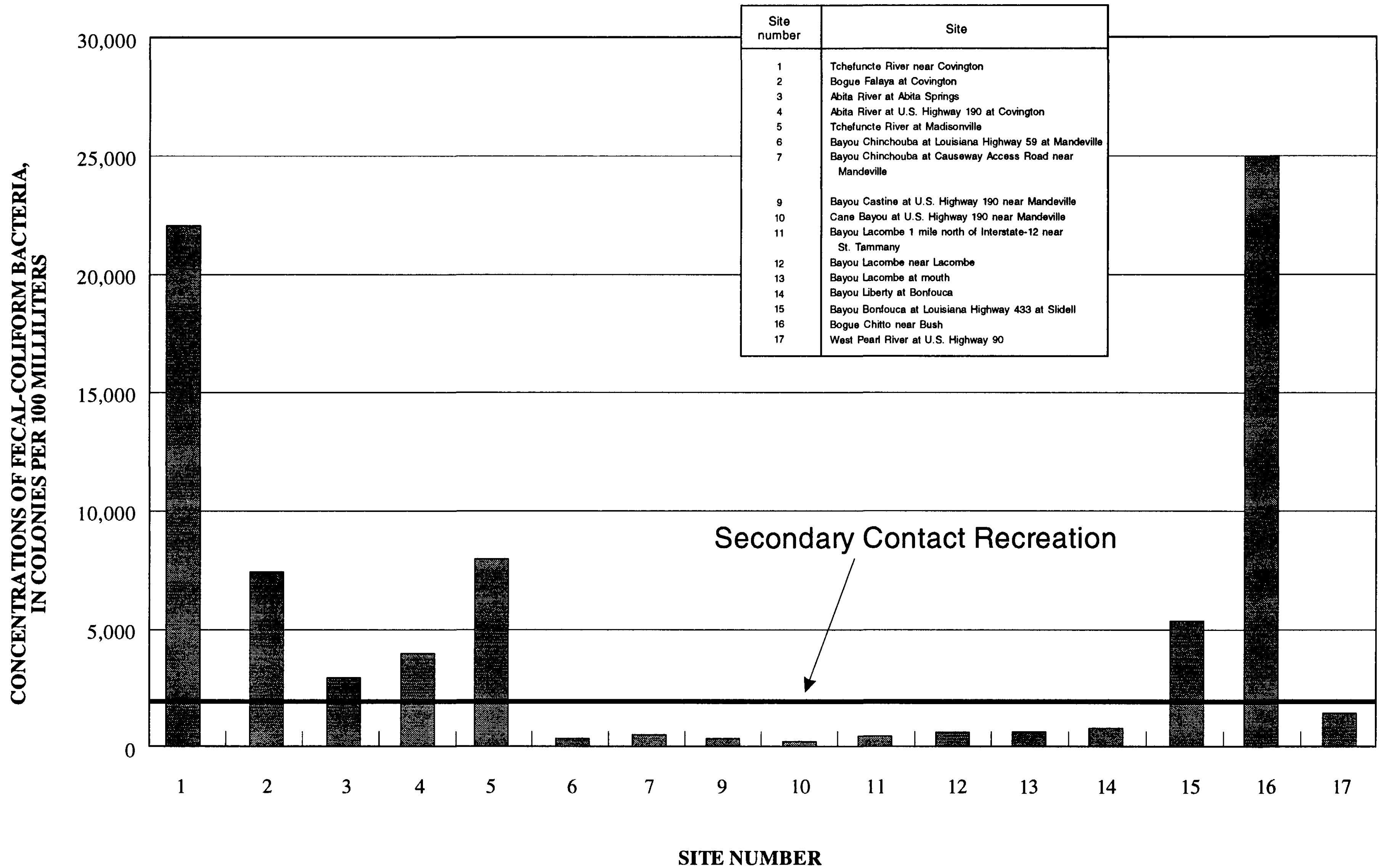
Graphs of Selected Surface-Water-Quality Data for St. Tammany Parish, Louisiana, April-August 1995



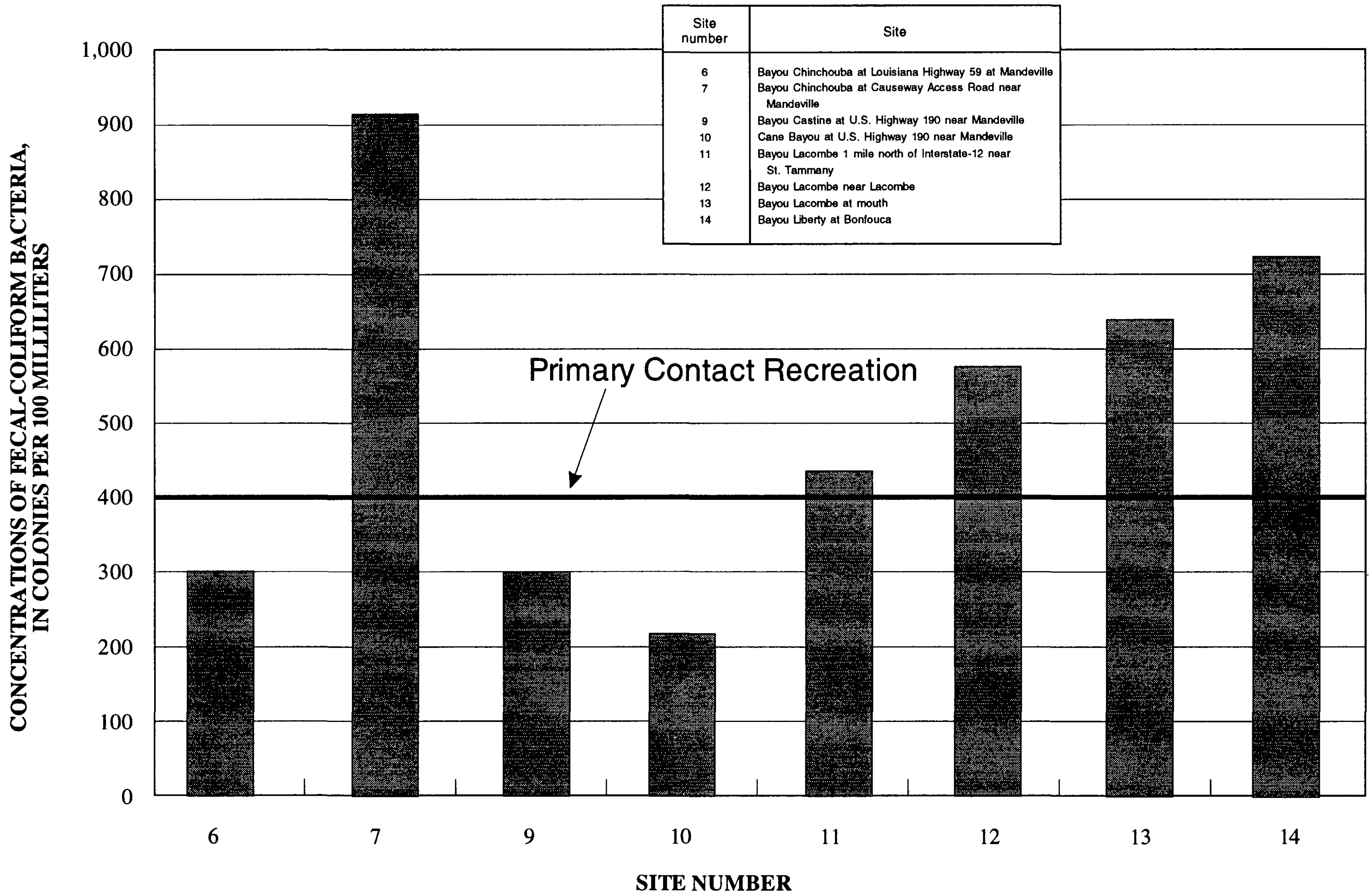
B-1. Biochemical oxygen demand for selected surface-water sites in St. Tammany Parish, Louisiana, April 12-13, 1995.



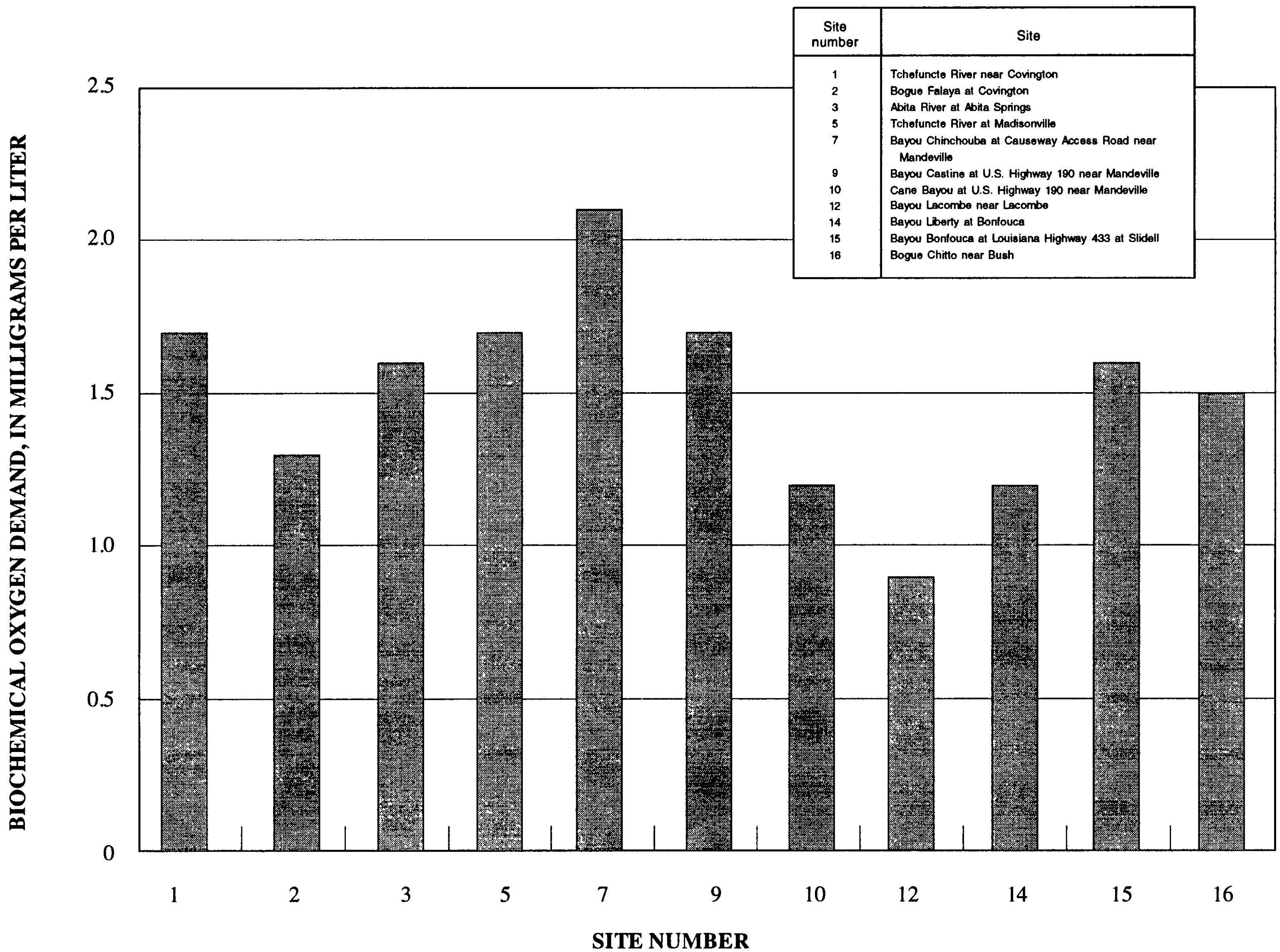
B-2. Dissolved nitrite plus nitrate and phosphorus concentrations for selected surface-water sites in St. Tammany Parish, Louisiana, April 12-13, 1995.



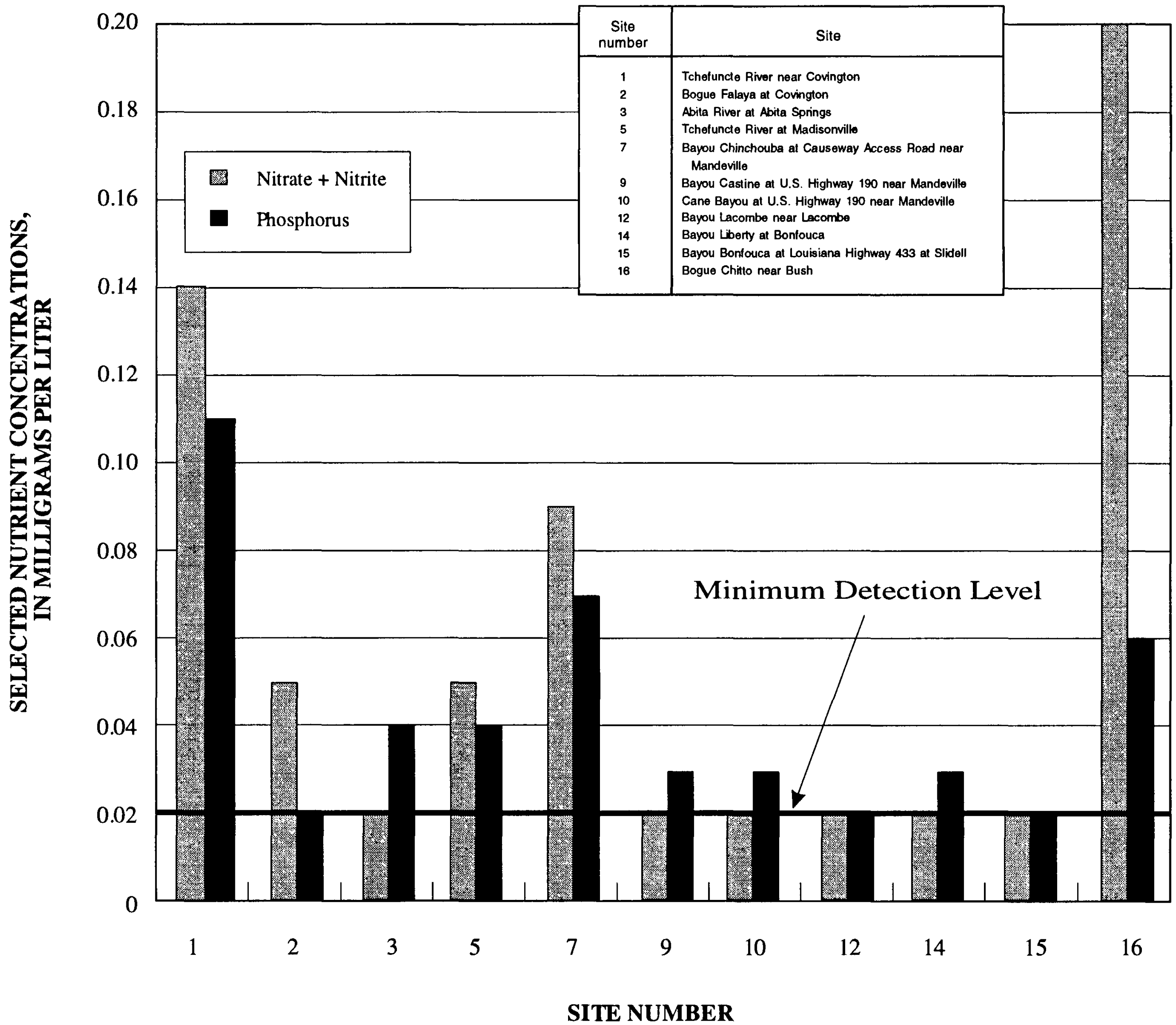
B-3. Concentrations of fecal-coliform bacteria for selected surface-water sites in St. Tammany Parish, Louisiana, April 12-13, 1995.



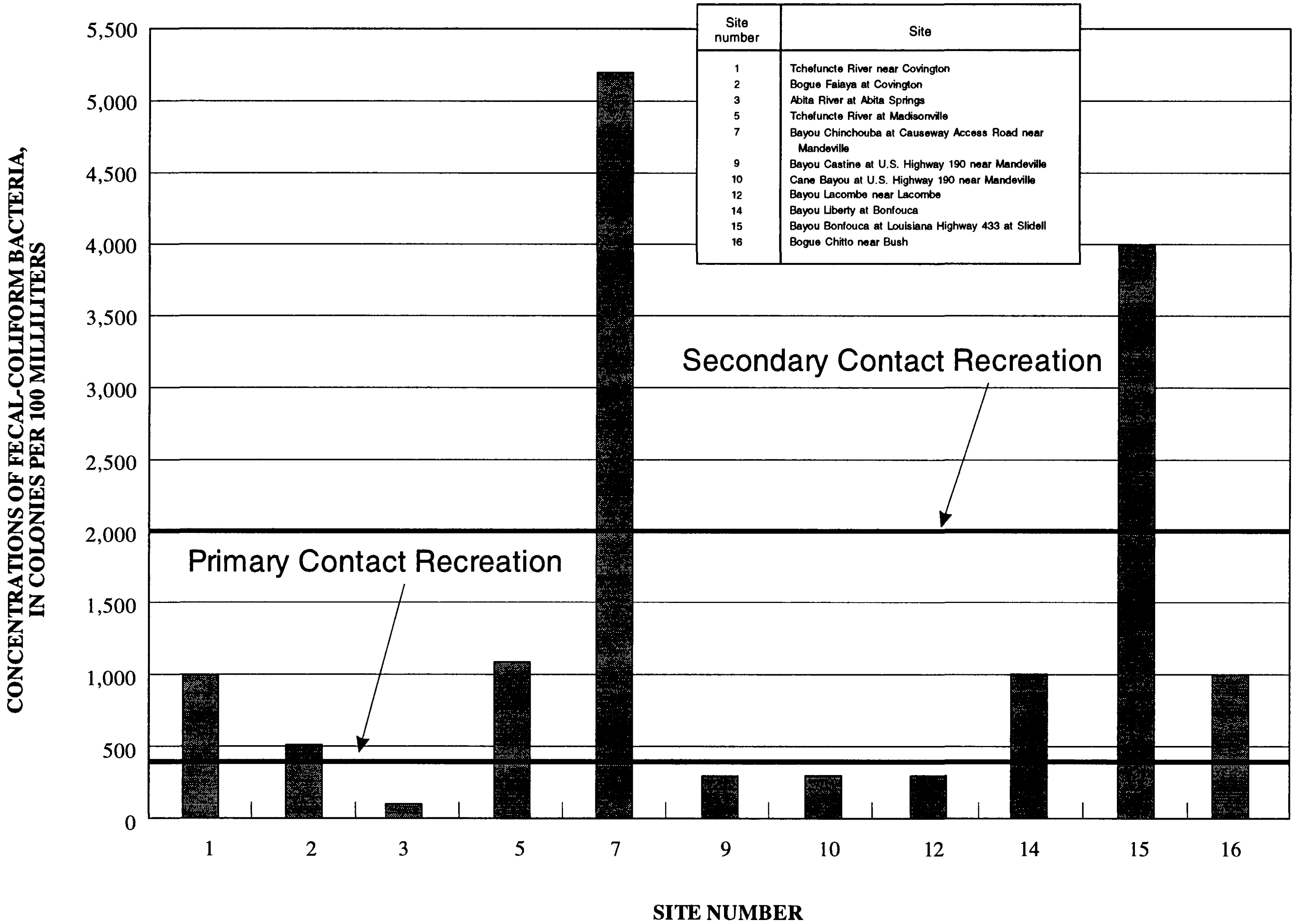
B-4. Concentrations of fecal-coliform bacteria for selected surface-water sites in St. Tammany Parish, Louisiana, April 13, 1995.



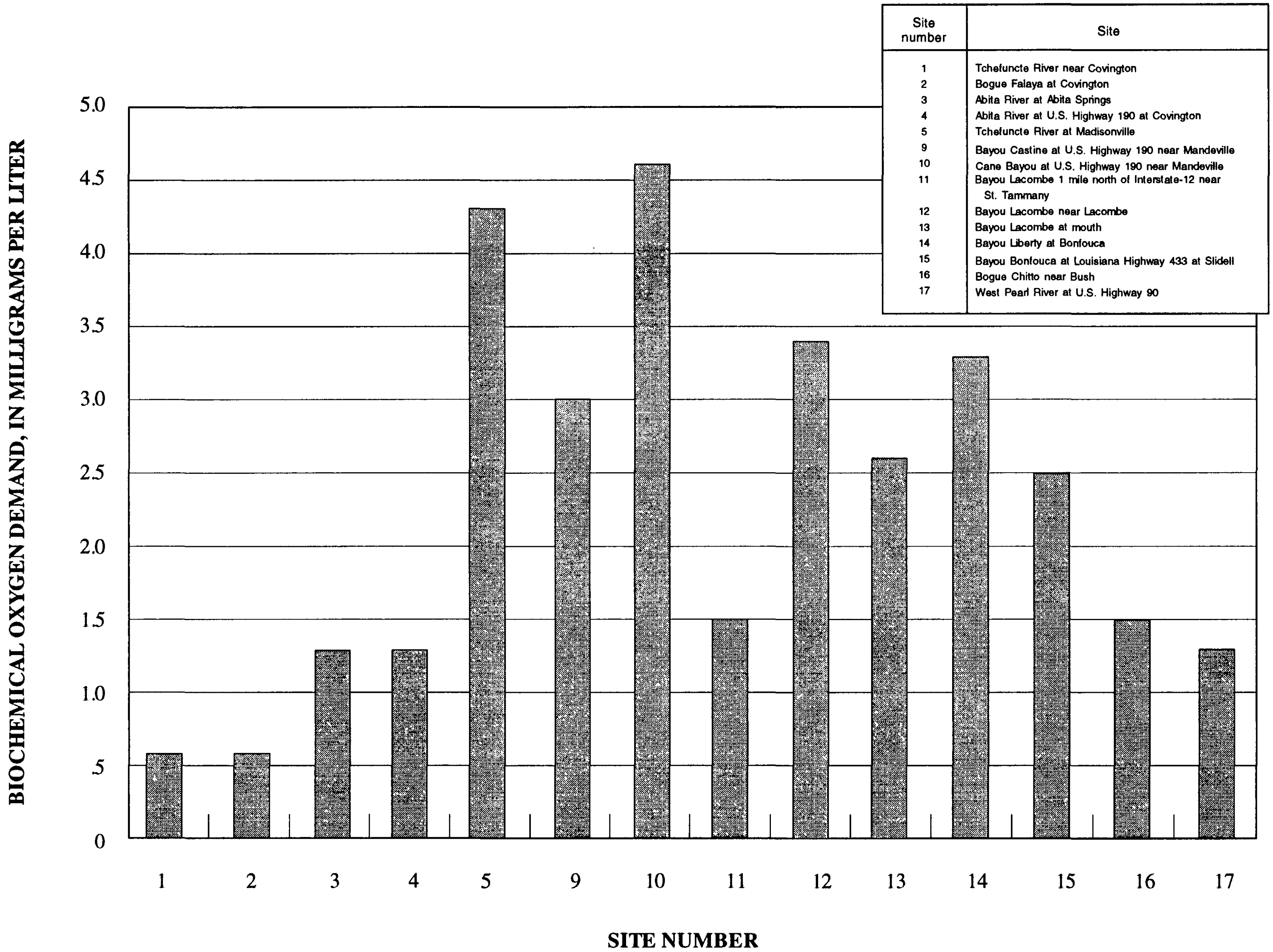
B-5. Biochemical oxygen demand for selected surface-water sites in St. Tammany Parish, Louisiana, May 12, 1995.



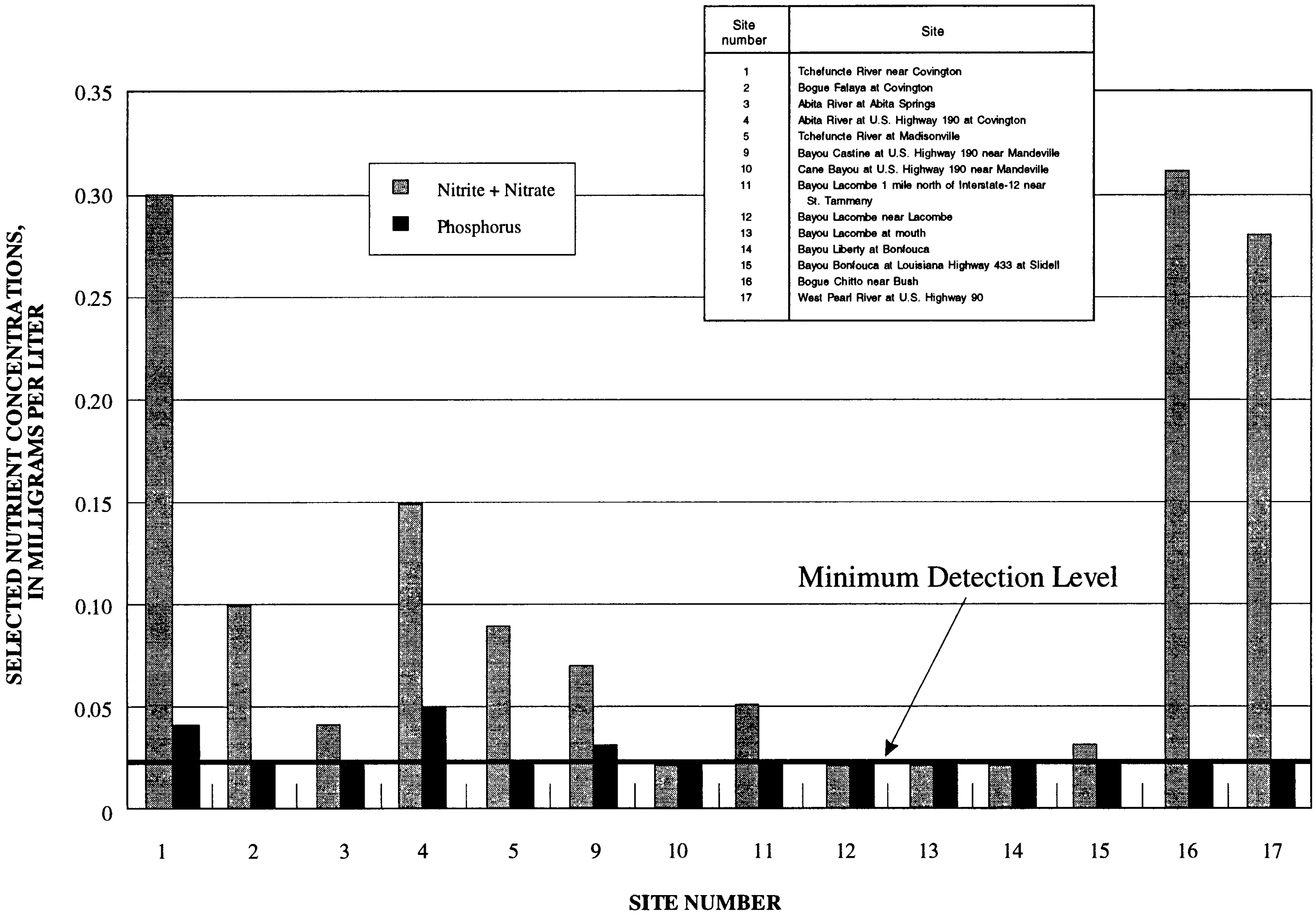
B-6. Dissolved nitrate plus nitrite and phosphorus concentrations for selected surface-water sites in St. Tammany Parish, Louisiana, May 12, 1995.



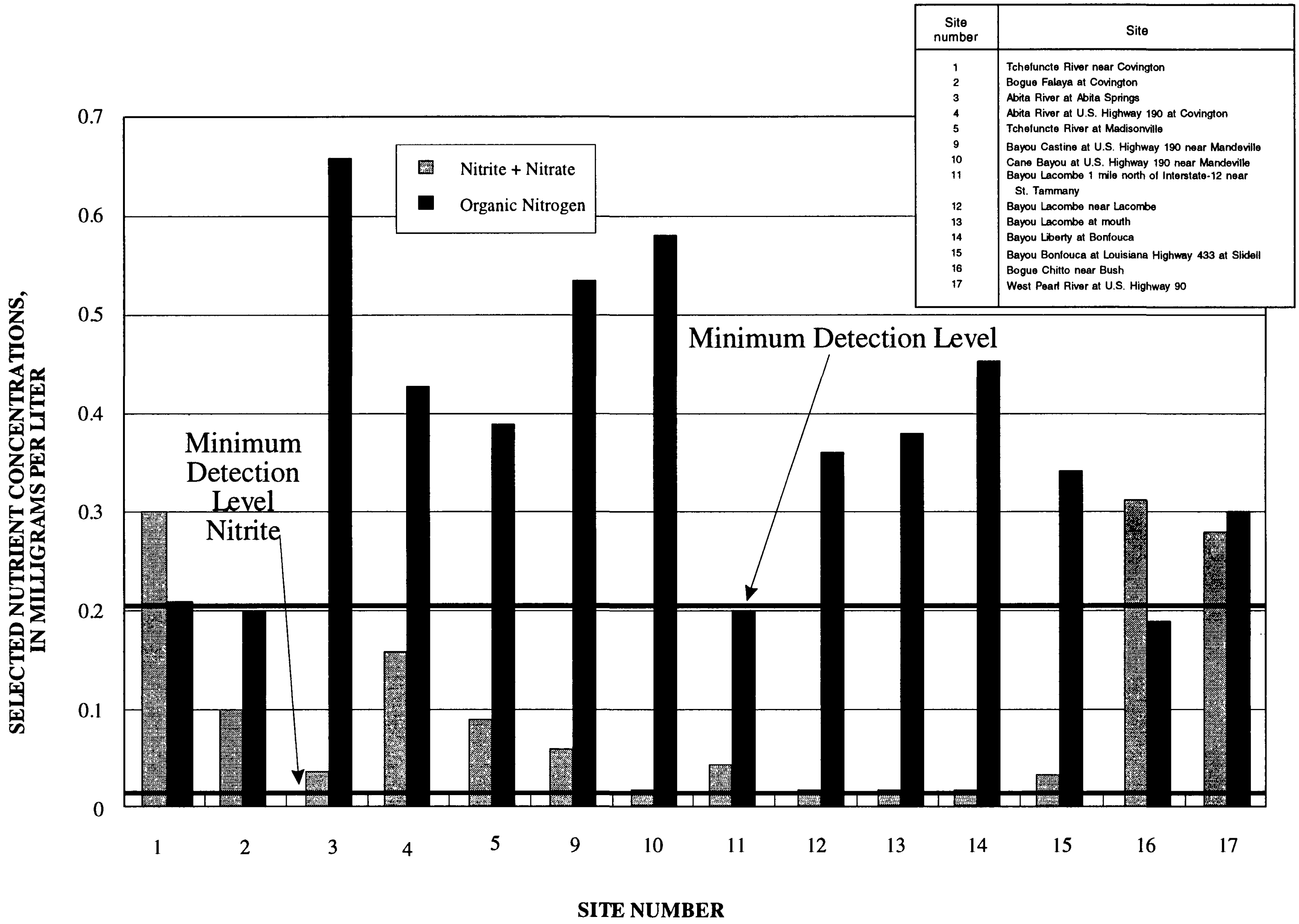
B-7. Concentrations of fecal-coliform bacteria for selected surface-water sites in St. Tammany Parish, Louisiana, May 12, 1995.



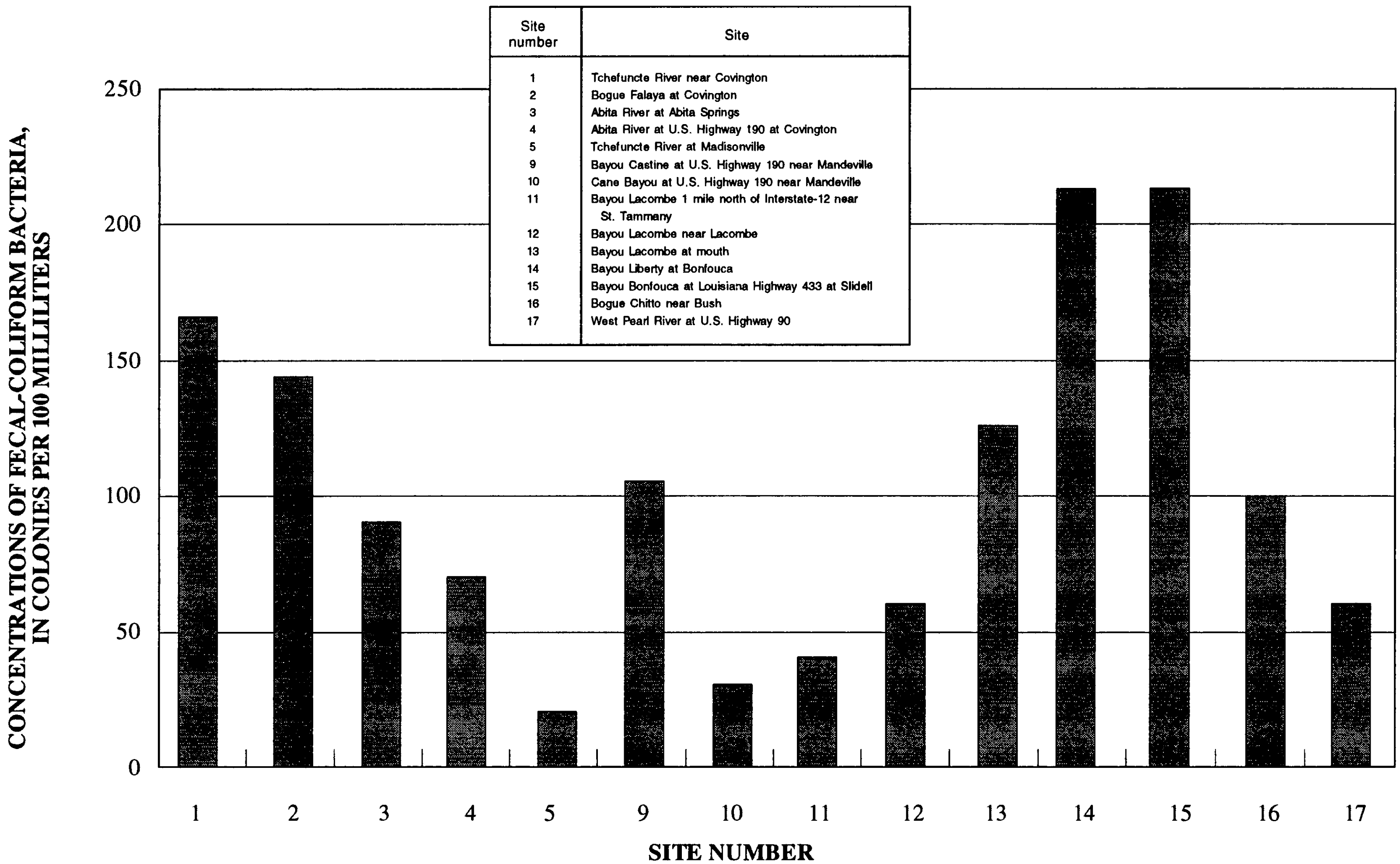
B-8. Biochemical oxygen demand for selected surface-water sites in St. Tammany Parish, Louisiana, June 7-9, 1995.



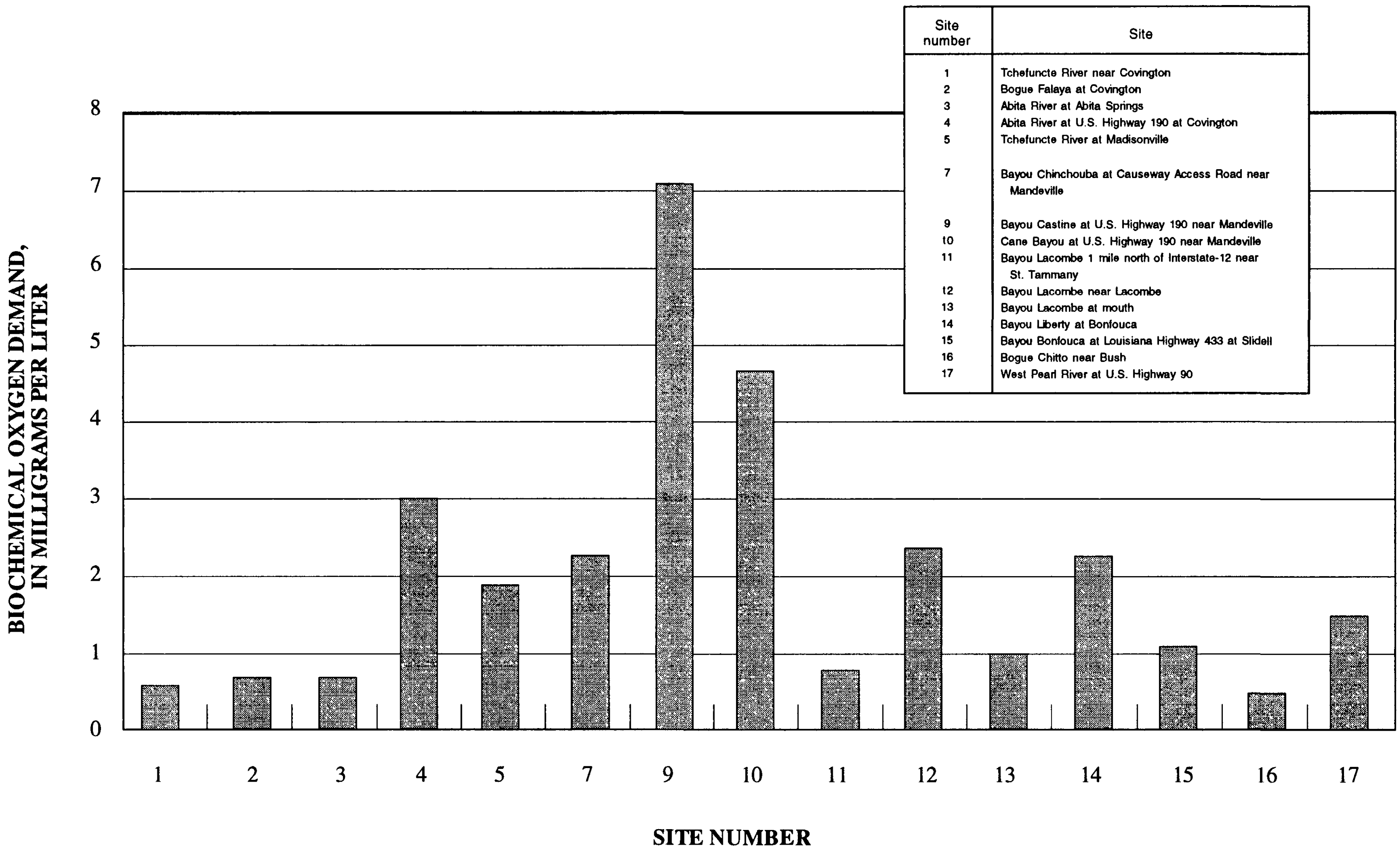
B-9. Dissolved nitrite plus nitrate and phosphorus concentrations for selected surface-water sites in St. Tammany Parish, Louisiana, June 7-9, 1995.



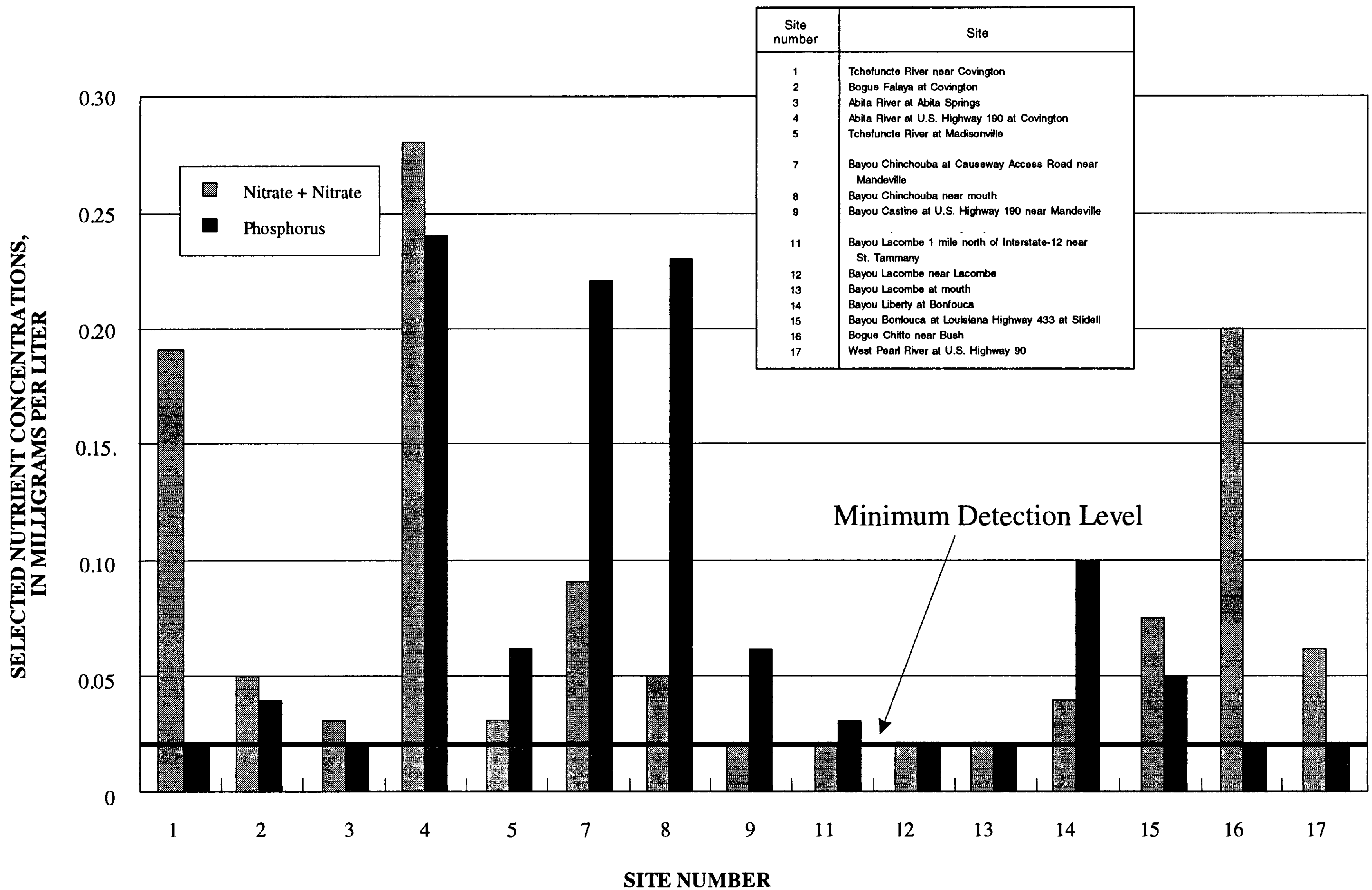
B-10. Dissolved nitrite plus nitrate and organic nitrogen concentrations for selected surface-water sites in St. Tammany Parish, Louisiana, June 7-9, 1995.



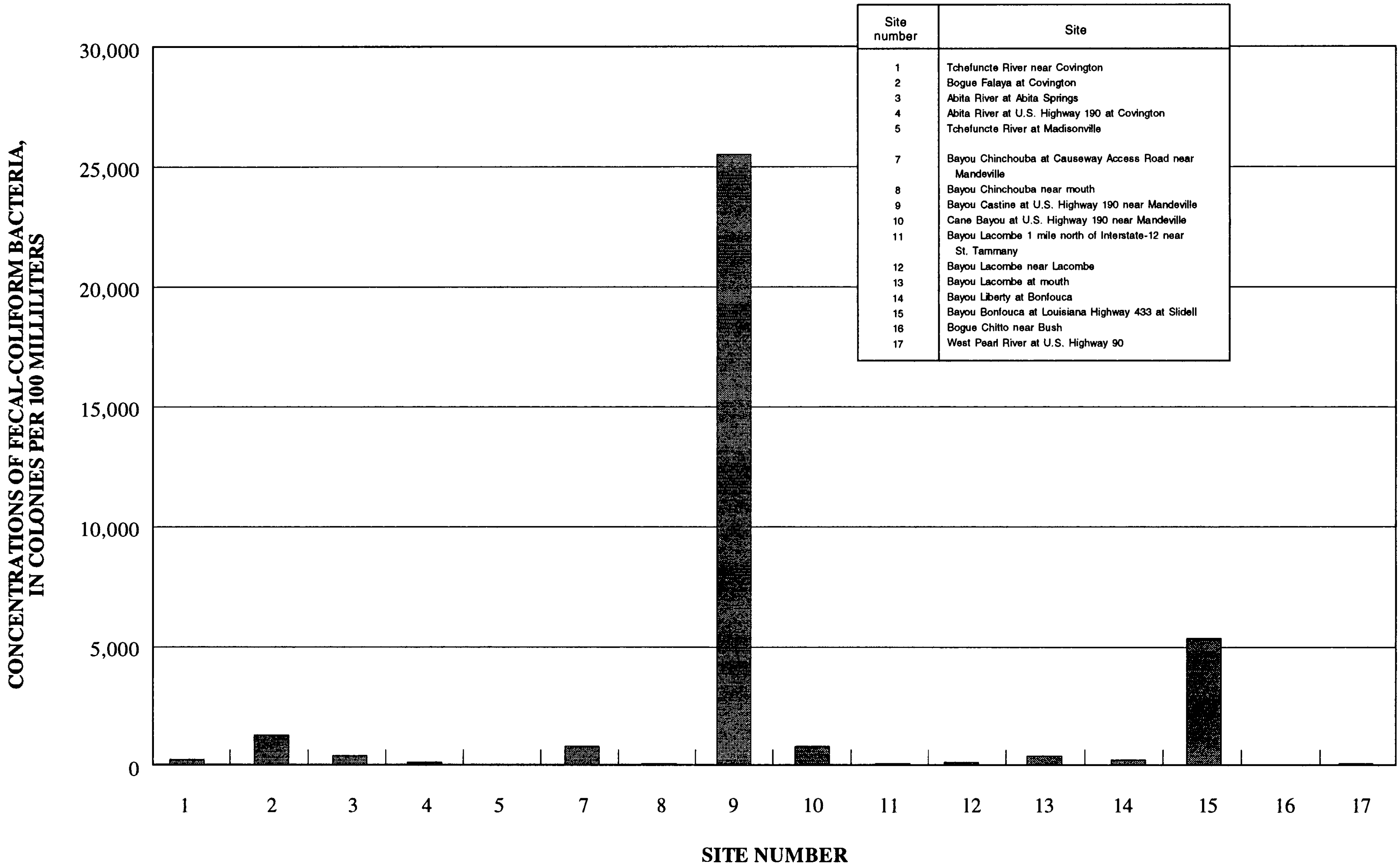
B-11. Concentrations of fecal-coliform bacteria for selected surface-water sites in St. Tammany Parish, Louisiana, June 7-9, 1995.



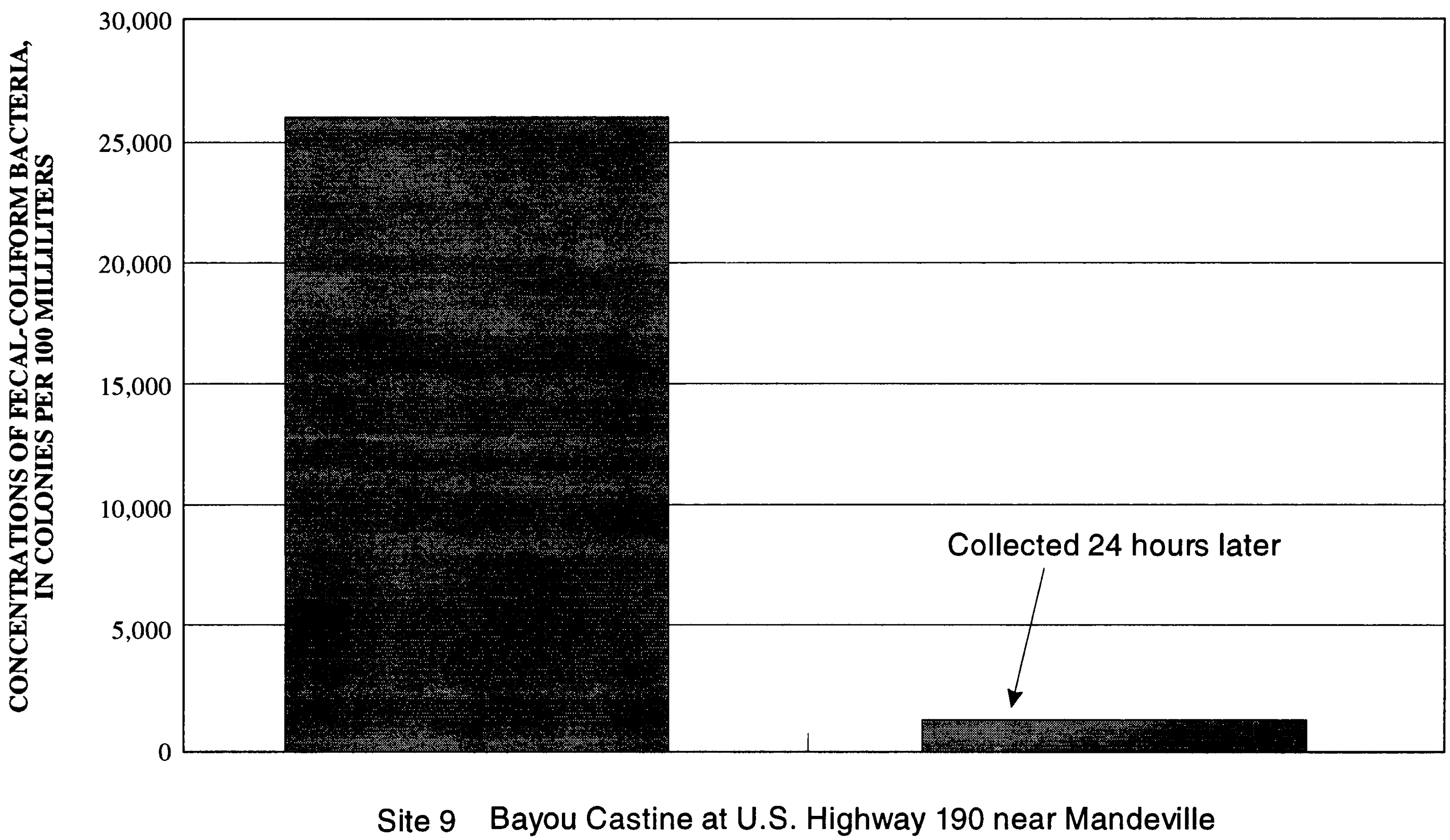
B-12. Biochemical oxygen demand for selected surface-water sites in St. Tammany Parish, Louisiana, August 1-2, 1995.



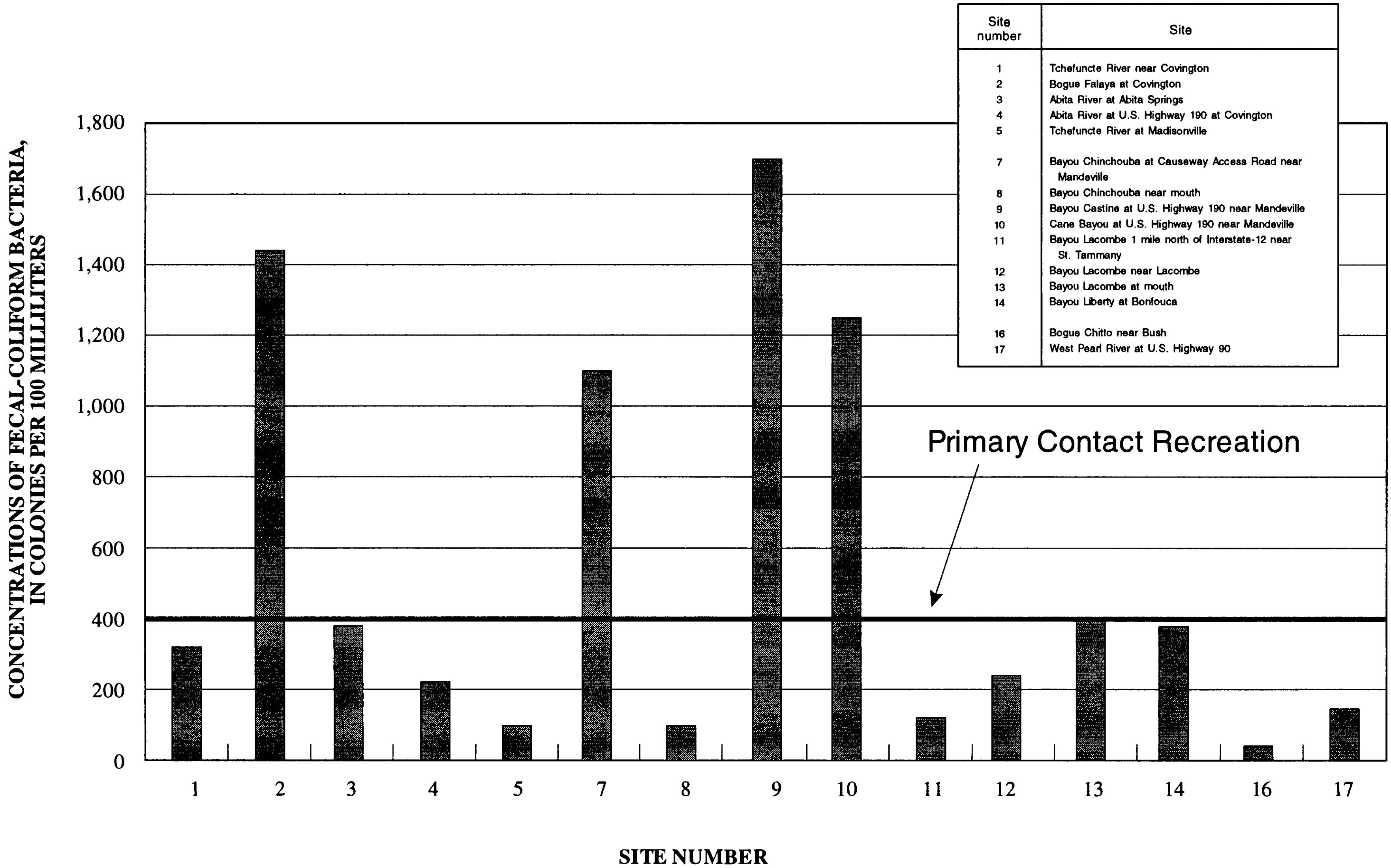
3-13. Dissolved nitrate plus nitrate and phosphorus concentrations for selected surface-water sites in St. Tammany Parish, Louisiana, April 1-2, 1995.



B-14. Concentrations of fecal-coliform bacteria for selected surface-water sites in St. Tammany Parish, Louisiana, August 1-2, 1995.



B-15. Concentrations of fecal-coliform bacteria for Bayou Castine in St. Tammany Parish, Louisiana, August 1 and 2, 1995.



B-16. Concentrations of fecal-coliform bacteria for selected surface-water sites in St. Tammany Parish, Louisiana, August 1-2, 1995.