GEOHYDROLOGY AND SUSCEPTIBILITY OF MAJOR AQUIFERS TO SURFACE CONTAMINATION IN ALABAMA; AREA 13

by Will S. Mooty

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CONVERSION FACTORS

For use of readers who prefer to use metric (International System) units, conversion factors for inch-pound units used in this report are listed below:

Multiply inch-pound unit	By	To obtain metric unit
inch (in.)	25.4	millimeter (mm)
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
square mile (mi^2)	2.590	square kilometer (km^2)
gallon per minute (gal/min)	0.06308	liter per second (L/s)
million gallons per day (Mgal/d)	0.04381	cubic meter per second (m^3/s)
cubic foot per second (ft^3/s)	0.02832	cubic meter per second (m^3/s)
cubic foot per second per square mile [$(ft^3/s)/mi^2$]	0.01093	cubic meter per second per square kilometer [$(m^3/s)/km^2$)

Sea level: In this report "sea level" refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929)--a geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called "Sea Level Datum of 1929."

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ABSTRACT

The U.S. Geological Survey, in cooperation with the Alabama Department of Environmental Management, is conducting a series of geohydrologic studies to delineate the major aquifers in Alabama and their susceptibility to surface contamination. The geohydrology and susceptibility to surface contamination of the major aquifers in Area 13, which includes Baldwin and Mobile Counties, are described in this report.

The major aquifers in the study area are the Pliocene-Miocene aquifer and the alluvial-coastal aquifer. The Pliocene-Miocene aquifer consists of the Citronelle Formation and the undifferentiated deposits of the Miocene Series. No continuous confining units exist between the Citronelle Formation and the Miocene Series undifferentiated, and as a result, the two units act as a single hydrologic unit. The alluvial-coastal aquifer, which occurs in stream valleys and along the coast, is hydraulically connected to the underlying Pliocene-Miocene aquifer and these two aquifers often respond to stresses as one aquifer.

The entire study area coincides with the recharge area for the two aquifers. The soils throughout most of the study area are highly permeable and allow rapid infiltration of surface water. Consequently, the study area is considered susceptible to surface contamination.

The Prichard-Mobile area is highly susceptible to surface contamination because ground-water withdrawals have created a depression in the potentiometric surface of the aquifers in this area. This depression increases the hydraulic gradient of the potentiometric surface of the ground water and increases flow towards the pumping centers. Other areas highly susceptible to surface contamination are those areas that are very flat and are underlain by permeable sediments that allow the rapid infiltration of surface water.

INTRODUCTION

The Alabama Department of Environmental Management (ADEM) is developing a comprehensive program to protect "Class I and II" ground waters (U.S. Environmental Protection Agency, 1984) in major aquifers from surface contamination. The U.S. Geological Survey, in cooperation with ADEM, is conducting a series of geohydrologic studies in Alabama to delineate the major aquifers and their recharge areas and to define areas susceptible to surface contamination. This report summarizes the alluvial-coastal aquifer and the Pliocene-Miocene aquifer in Area 13, which includes Baldwin and Mobile Counties (plate 1). The Pliocene-Miocene aquifer was so named by mutual agreement between Alabama State and Federal hydrologists contrary to the U.S. Geological Survey's policy of phasing out time-stratigraphic names for aquifers.

Purpose and Scope

The purpose of this report is to describe the geohydrology of the study area, delineate and describe the major aquifers and their recharge areas, and delineate areas within the recharge areas that are susceptible to surface contamination. Previously compiled geologic and hydrologic data provided about 80 percent of the information used to evaluate the major aquifers in the area. All wells used for municipal and rural public water supplies were inventoried and water levels were measured in these wells where possible. Data on water use were compiled during the inventory. Water-level data were used to prepare a generalized potentiometric surface map of the aquifers. Areas susceptible to surface contamination were delineated from topographic maps, geologic maps, and field investigations.

Location and Extent of the Study Area

Area 13 is in southwestern Alabama on the northern coast of the Gulf of Mexico (plate 1). The two counties that comprise the study area, Mobile and Baldwin, have a combined land area of about 2,828 mi^2 (square miles) (Alabama Dept. of Economic and Community Affairs, 1984). The area includes the major cities of Mobile, Prichard, Bay Minette, and Gulf Shores and many other smaller towns and communities. The total population of the area was about 444,000 in 1980 (U.S. Department of Commerce, 1984). Much of the land in Baldwin and Mobile Counties is used for agricultural purposes. Large areas along the Mobile and Tensaw Rivers and along the coast are characterized by low-lying, swampy terrain and brackish water. In recent years, the city of Gulf Shores and most of coastal Baldwin County have become highly-developed resort areas. The Mobile area has developed large industries.

The primary source of water for the city of Mobile is an impoundment on Big Creek. The average withdrawal rate from Big Creek is about 86.5 Mgal/d (million gallons per day). The remaining cities and towns use ground water for their public supply.

Previous Investigations

Numerous reports that describe the geology and hydrology of the study area have been published. A detailed description of the geology of Alabama and a revised geologic map were published by the Geological Survey of Alabama in 1926 (Adams and others, 1926).

Other reports that contain information on the geology and ground-water resources of the area are "Water Availability of Baldwin County, Alabama" (Reed and McCain, 1971); "Geology of Baldwin County, Alabama" (Reed, 1971b); "Water Availability in Mobile County, Alabama" (Reed and McCain, 1972); "Geology of Mobile County, Alabama" (Reed, 1971a); "Water Content and Potential Yield of Significant Aquifers in Alabama" (Barksdale and others, 1976); and "Ground-Water Investigations in the Mobile Area, Alabama" (Peterson, 1947).

Physical Features

Study area 13 lies entirely within the East Gulf Coastal Plain physiographic section (fig. 1). The majority of the land area of Mobile and Baldwin Counties lies in the Southern Pine Hills District (Sapp and Emplaincourt, 1975). The upland area is underlain by terrigenous sediments. Terrace deposits occur along major streams in the area. The terrain of the Southern Pine Hills District slopes gradually from 350 feet above sea level southward to about 30 feet at the southern limit of the area.

Parts of the study area along the Mobile and Tensaw Rivers are in the Alluvial-Deltaic Plain District which consists of alluvial and terrace deposits from the rivers. These areas have very little relief, and the surface ranges in altitude from 100 feet to sea level.

Coastal areas of study area 13 are in the Coastal Lowlands District. These areas are characterized by flat to gently undulating, locally swampy plains underlain by terrigenous deposits of Holocene and late Pleistocene age. They include the mainland plain indented by many tidal streams and fringed by tidal marshes and barrier islands. The landward edge of the district is defined by the base of the Pamlico marine scarp at 25 to 30 feet of elevation. The barrier islands and tidal marshes in the area are undergoing continuing modification by erosion and deposition.

Acknowledgments

The author wishes to thank the managers of the public water supplies in Mobile and Baldwin Counties for the information they supplied on the locations and construction of the public-supply wells.

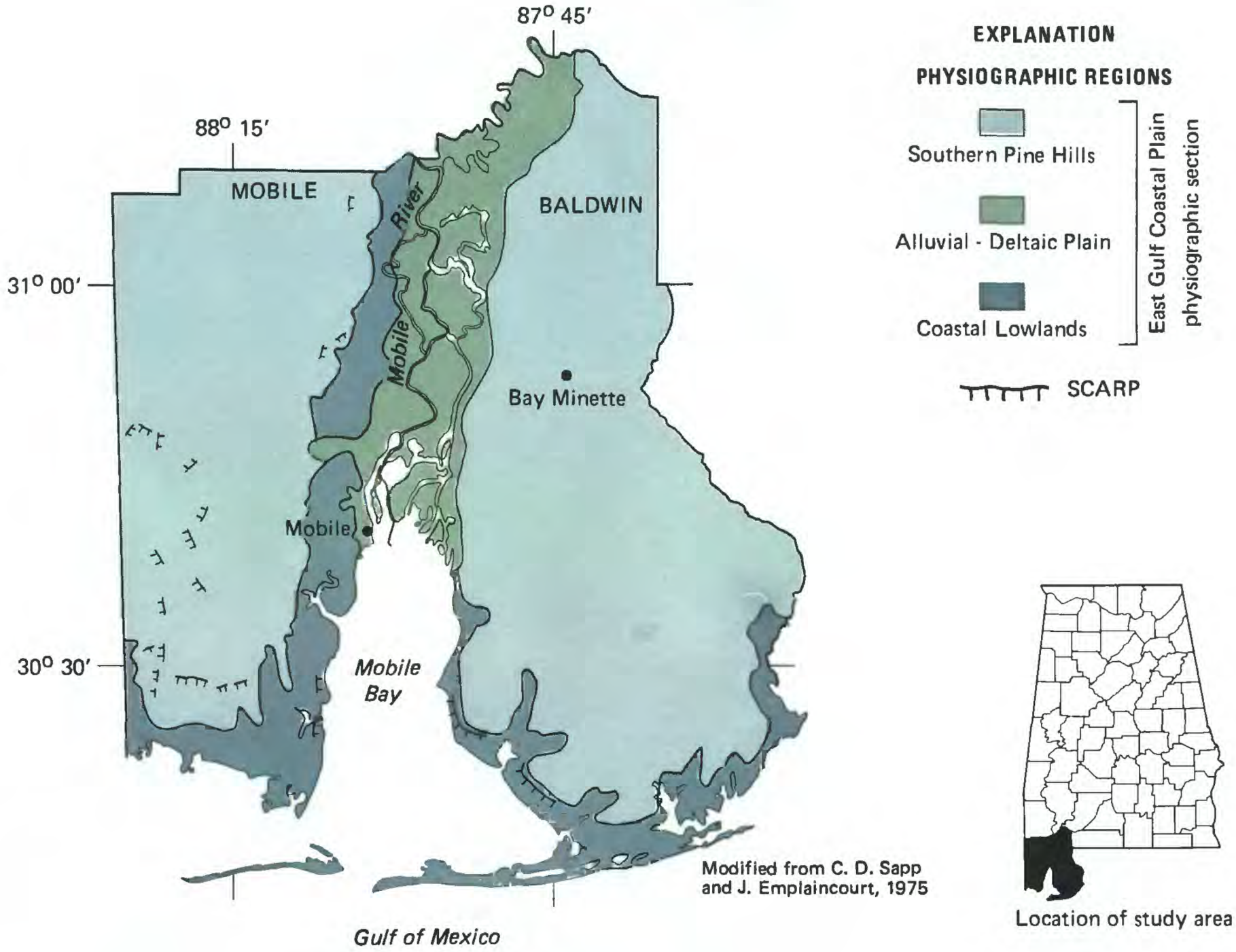

Figure 1.--Physiographic regions of the study area.

GEOHYDROLOGY

Geologic units that crop out in the study area range in age from Tertiary to Quaternary (table 1). The Tertiary age sedimentary deposits are generally unconsolidated. Alluvial and terrace deposits of Quaternary age overlie Tertiary age deposits in and adjacent to the flood plains of the larger streams and rivers, and along the coastal areas of Mobile Bay and the Gulf of Mexico (fig. 2).

Tertiary Deposits

A thick sequence of Tertiary age sediments underlies the study area. The geologic units that are sources of potable ground water are the Miocene Series undifferentiated and the Citronelle Formation.

Miocene Series Undifferentiated

The Miocene Series crops out in central and northern Mobile and Baldwin Counties. The unit ranges in thickness from 100 feet in northern Baldwin County to 3,400 feet in the subsurface in southern Mobile County (Reed, 1971). The Miocene sediments are somewhat wedge-shaped and dip southwestward toward the Gulf of Mexico (fig. 3). The dip of the sediments ranges from about 40 ft/mi (feet per mile) at the base of the series to about 15 ft/mi at the contact with the Citronelle Formation.

The Miocene Series consists of sedimentary deposits of marine and estuarine origin. The sediments consist mainly of laminated to thinly-bedded clays, sands, and sandy clays. The sands range from fine- to coarse-grained and are locally cross bedded. In outcrops, the sands weather to a variety of colors, some distinctly mottled. At some exposures, beds of sand contain gravel and petrified plant fossils, and clays contain carbonized leaf remains.

The Miocene appears to have been deposited in an environment transitional between the estuarine and deltaic deposits west of the study area and the shallow marine deposits east of the study area (Riccio and others, 1973).

Pliocene Series

Citronelle Formation

The Citronelle Formation of Pliocene age overlies the Miocene Series and crops out in central and southern parts of the study area. The formation, which is relatively thin in northern parts of the study area, is about 200 feet thick in the subsurface in the southern part of the study area (fig. 3). The sediments consist of gravelly sands and sandy clays. In many areas, lenses of sandy clay and clayey sand, which range in thickness from 5 to 15 feet, are interbedded with gravelly sand. Sediments along the base of the Citronelle Formation have a high clay content, indicating that they were deposited in an estuarine environment, whereas, overlying sediments were deposited by sediment-laden streams (Isphording and Lamb, 1971).

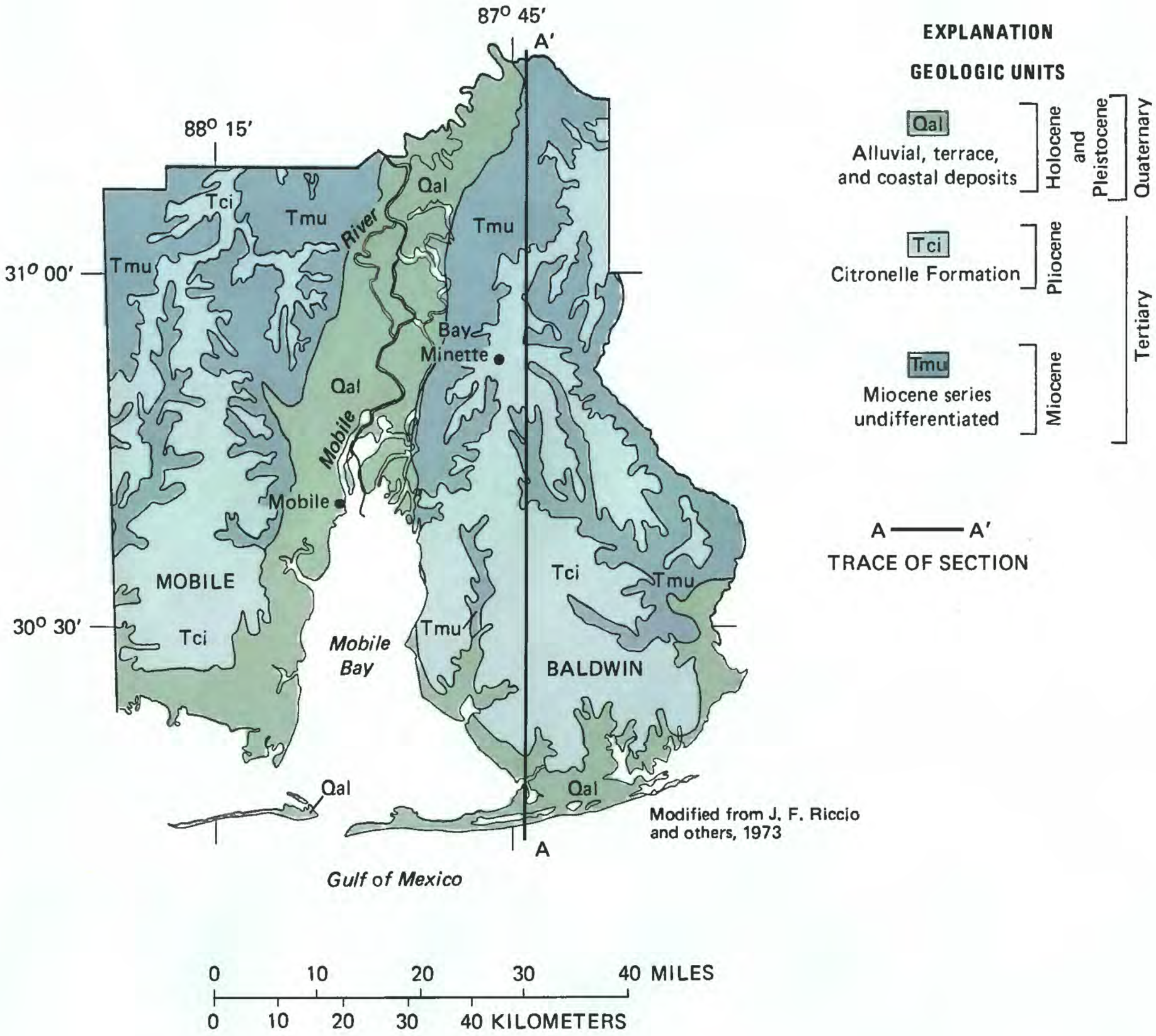

Figure 2.--Generalized geologic map of the study area.

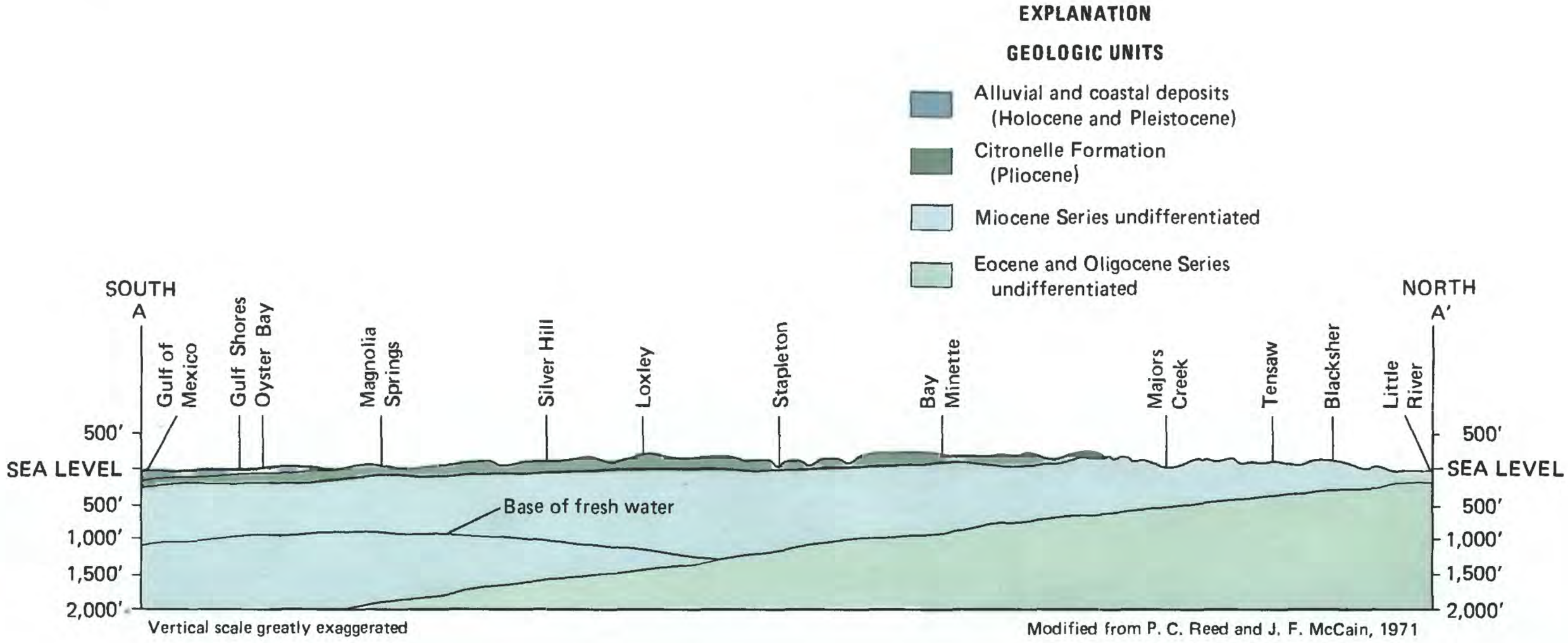

Figure 3.--Generalized geohydrologic section from south to north in Baldwin County (line of section shown on figure 2).

Quaternary Deposits

Pleistocene Series

High terrace deposits

High terrace deposits unconformably overlie Miocene sediments in the northeastern part of Mobile County and in many parts of Baldwin County that are adjacent to the Mobile River flood plain. The terrace deposits range in thickness from 0 to 50 feet with an average thickness ranging from 15 to 30 feet. The altitude of the base of the terrace deposits ranges from 130 to 180 feet above sea level in Mobile County, and from 60 to 210 feet above sea level in Baldwin County. The deposits consist primarily of sandy clay, fine- to coarse-grained sand, and sand containing gravel at some places. These terrace deposits are considered a part of the alluvial-coastal aquifer.

Pleistocene and Holocene Series

Alluvial, low terrace, and coastal deposits

Alluvial, low terrace, and coastal deposits overlie Miocene and Pliocene sediments in many parts of the counties. They represent complex beach, dune, lagoonal, estuarine, and deltaic depositional environments. The deposits consist of very fine- to coarse-grained sand that is gravelly in many exposures. Sandy clay is interbedded with the sand at some exposures. Chandler (1983) estimated the thickness of the alluvial, low terrace, and coastal deposits to range from 0 to 200 feet, based on the first occurrence of coarse siliclastic sediments.

The Quaternary sand and gravel beds represent buried channel deposits. Their width and depth are similar to that of the present river bed sediments. The length of individual sand and gravel beds probably ranges from a few hundred to a few thousand feet. These buried channel deposits are surrounded by silt and clay sediments similar to those being deposited on the present flood plain of the river.

HYDROLOGY OF THE MAJOR AQUIFERS

The major aquifers in the study area are the Pliocene-Miocene and the alluvial-coastal aquifers. Although the alluvial-coastal deposits, the Citronelle Formation (of the Pliocene Series), and the Miocene Series undifferentiated are lithologically different, they are hydraulically connected. These aquifers generally respond to stresses as a single aquifer and are shown as having only one potentiometric surface on plate 1 (Walter, 1976).

Ground water in the Pliocene-Miocene aquifer occurs in beds of sand and gravel which are lenticular in shape and of limited lateral extent. The sand and gravel beds in the Citronelle Formation and those at shallow depths in the Miocene Series undifferentiated are hydraulically connected to land surface; therefore, the aquifer is unconfined. Discontinuous lenses of clay within these deposits retard the vertical movement of water but do not separate the aquifers. At depth clayey sediments in the Miocene Series are semi-confining, which reduces vertical infiltration of water. Thus, the aquifer in deeper portions of the Miocene Series responds to short-term pumpage as a confined aquifer.

Except in northernmost and easternmost parts of the outcrop area, wells properly constructed in the Pliocene-Miocene aquifer yield from 0.5 to 2.0 Mgal/d. A few wells producing over 2 Mgal/d have been developed in Mobile and Baldwin Counties.

The alluvial-coastal aquifer is hydraulically connected to the Pliocene-Miocene aquifer. Properly constructed wells in the alluvial-coastal aquifer have the potential to yield from 0.5 to 1.0 Mgal/d. Most high-yield wells are completed in beds of sand and gravel that originate from coastal deposits and buried river sediments. The buried channels are surrounded by silty and clayey sediments that do not yield significant amounts of water, but do allow slow infiltration of water to the sand and gravel beds. Individual buried channels may be directly connected to the present channels of the Mobile River.

Recharge and Movement of Ground Water

The source of recharge to the aquifers is rainfall, which averages 62 in/yr (inches per year) in the study area (National Oceanic and Atmospheric Administration, 1985). About 28 in/yr of rainfall runs off during and immediately after storms (Reed and McCain, 1971); a small amount of rainfall infiltrates the subsurface as recharge to the aquifers; and the remainder is returned to the atmosphere by evaporation and transpiration of trees and other plants.

The amount of water that infiltrates the soil depends on the saturated hydraulic conductivity and permeability of the soil, the amount of water present in the soil during rainfall, and the slope of the land surface. Infiltration is greater in an area that is flat and underlain by gravel and coarse sand sediments than in an area with a sloping land surface that is underlain by dense clay.

Most recharge to the major aquifers in Mobile and Baldwin Counties occurs within the boundaries of the study area (plate 1), and a small amount is contributed from Miocene outcrop areas to the north. The amount of recharge to aquifers may be estimated from the base (dry-weather) flow of streams which is ground-water discharge. The average baseflow (7-day Q_2) for streams in Area 13 is about 0.601 $(ft^3/s)mi^2$ (cubic feet per second per square mile) of drainage area or about 8.16 in/yr (Bingham, 1982).

Water moves downdip from areas of recharge to areas of natural discharge or areas of ground-water withdrawals, generally perpendicular to the potentiometric contour lines shown on plate 1.

Natural Discharge and Ground-Water Withdrawals

Ground water discharges are primarily to streams, water bodies, and wells. Some of the larger ground-water pumping centers in the study area are the cities of Foley, Robertsdale, Bay Minette, Orange Beach, Gulf Shores, Fairhope, Daphne, and Spanish Fort in Baldwin County; and Grand Bay, Fairview, Dauphin Island, Theodore, Kushla, LeMoyne, Citronelle, Mt. Vernon, Bayou La Batre, Saraland, and St. Elmo in Mobile County (table 2).

In addition to public water supply, substantial quantities of ground water are used for irrigation in Baldwin and Mobile Counties. Mobile County has several chemical and paper factories and other industries that use large quantities of ground water. In 1985 total withdrawals of ground water for all uses in the study area were about 38 Mgal/d (Baker and Mooty, 1987).

Effects of Withdrawals from the Aquifers

Large withdrawals of water from an aquifer often cause a depression in the potentiometric surface of the aquifer. The extent of the depression depends on the amount of water withdrawn and the water-bearing characteristics of the sediments. A large depression exists around the Prichard-Mobile area in Mobile County (plate 1). Most of the ground-water withdrawals in this area are for industrial purposes. Other smaller depressions occur in the vicinity of some industries along the Mobile River in northern Mobile County. The effects of the depressions are localized because of their proximity to the Mobile River which is hydraulically connected to the aquifers in the area. The Mobile River has an average annual discharge of about 70,000 ft^3/s (cubic feet per second), which is more than adequate to recharge the aquifers as withdrawals occur. However, in tidal reaches of the Mobile River, the recharge could introduce saltwater into the aquifer.

Depressions in the potentiometric surface may eventually result in increased pumping costs due to the decline in the water surface and the depths at which some wells must be finished. A depression in the potentiometric surface also creates a steepened gradient in the vicinity of a pumping center and increases the rate of movement of a potential contaminant to points of ground-water withdrawal.

SUSCEPTIBILITY OF THE AQUIFERS TO SURFACE CONTAMINATION

Recharge areas for the major aquifers, which includes the entire study area, are susceptible to surface contamination (plate 1). A few areas where clay or marl crops out at land surface are not good recharge areas; however, none of these outcrop areas are large enough to be shown on the map in plate 1. Much of the study area is rural and, particularly in Baldwin County, a large percentage of the land is under agricultural production. The topography in the study area is flat to low rolling hills. This type of terrain minimizes surface runoff, allowing more time for water to infiltrate into the soil. The primary aquifers in the study area, the Pliocene-Miocene and the alluvial-coastal, are hydraulically connected and, therefore, act as a single hydrologic unit.

Areas that are highly susceptible to contamination from the surface are shown on plate 1. These are areas of relatively flat terrain with very permeable soils. Many of these areas are used for intensive row-crop farming where pesticides are used extensively. Along the Mobile River in the northern part of Mobile County, chemical industries are potential sources of contamination to the ground water. The regions of the study area that are not considered to be highly susceptible to surface contamination are where topographic relief is greater; this promotes increased surface runoff and dispersion and dilution of surface contaminants.

Regions underlain by the alluvial and coastal sediments generally are areas of ground-water discharge; this decreases the likelihood of a contaminant migrating into the deep ground-water system. However, withdrawals of ground water from these areas could cause water levels to decline and could change the direction of ground-water flow. If this were to happen, the discharge area would become a recharge area and, because the topography is flat and the region is underlain by permeable sediments, this part of the aquifer would become highly susceptible to surface contamination. This has already occurred to some extent in an area north of the city of Mobile along the Mobile River.

Coastal areas are susceptible to saltwater contamination from storm surges. The occasional hurricane that strikes the Gulf Coast can cause tides to rise 5 to 15 feet above normal; this allows saltwater to infiltrate the ground-water system in coastal areas. Saltwater contamination by this method has not been a serious problem in the public water-supply systems near coastal areas to date, because wells in these systems generally tap deep sands with potentiometric heads above sea level. Saline water entering the subsurface from land surface would be discharged to the Gulf of Mexico before reaching the intake depth of the wells. Saline water could, however, present a problem to some shallow wells near coastal areas.

SUMMARY AND CONCLUSIONS

The major aquifers in Area 13 are the Pliocene-Miocene aquifer and the alluvial-coastal aquifer. The recharge areas for these aquifers are primarily within or just north of the study area. The undifferentiated deposits of the Miocene Series, the Citronelle Formation, and the alluvial, terrace and coastal deposits of Quaternary age that make up these aquifers are hydraulically connected and act as a single hydrologic unit. Discontinuous lenses of clay within these deposits retard the vertical movement of ground water, but do not separate the aquifers.

The entire study area is considered to be susceptible to contamination from the surface owing to the permeability of the underlying sediments. The soils are highly permeable, which allows rapid infiltration of water. Areas around some of the large pumping centers are highly susceptible to contamination, not only because of the permeable nature of the sediments and the slope of the land surface, but also because of depressions created in the potentiometric surface by large withdrawals of water from the aquifers. These depressions act as funnels to direct ground-water flow toward pumping centers and increase the rate at which a potential contaminant can migrate into the ground-water system. Other areas of high susceptibility are regions characterized by flat terrain, which decrease the rate of surface runoff, and highly permeable soils, which increase the rate of infiltration from the surface. Many of these areas are farmed intensively and a potential exists for the contamination of ground water with pesticides.

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Table 1.--Geologic units and their water-bearing properties (modified from Reed, 1972)

System	Series	Geologic unit	Thickness (feet)	Lithology		Yield	Quality of water
Quaternary	Holocene and Pleistocene	Alluvium, low-terrace and coastal deposits	0-200	Sand, white, gray, orange, and red, very fine to coarse-grained, contains gravel in places; gray and orange sandy clay.	Alluvial/coastal aquifer	Will yield 10 gal/min where saturated sands are of sufficient thickness. Potential source of 0.5 Mgal/d per well in the Mobile River basin.	Water generally suitable for most uses but commonly contains iron in excess of 0.3 mg/L and may be sufficiently acidic to be corrosive. Locally, in areas close to Mobile Bay and Mississippi Sound, water is very hard, has high chloride and dissolved-solids contents, and contains iron in excess of 0.3 mg/L.
		High-terrace deposits	0-50			Will yield 10 gal/min or more where saturated sands are of sufficient thickness.	Probably soft and low in dissolved solids. May contain iron in excess of 0.3 mg/L.
Tertiary	Pliocene	Citronelle Formation	0-200	Sand, brown, red, and orange, fine- to coarse-grained, gravelly in places, contains clay balls and partings; gray, orange, and brown lenticular sandy clay, ferruginous cemented sandstone.	Pliocene/Miocene aquifer	Will yield 2 Mgal/d or more per well.	Water generally is soft and low in dissolved solids but may contain iron in excess of 0.3 mg/L and may be sufficiently acidic to be corrosive. In areas adjacent to Mobile River, Mobile Bay, and Mississippi Sound, water may have a dissolved-solids content that exceeds 1,000 mg/L, a sulfurous odor, and a chloride content that exceeds 500 mg/L.
	Miocene	Miocene Series undifferentiated	100-3,400	Sand, gray, orange, and red very fine to coarse-grained, contains gravel in places; gray thin-bedded to massive sandy silty clay.			

Table 2.--Records of public water-supply wells in the study area

NOTE: Well numbers correspond to those shown on plate 1.

Geographic coordinate number: Latitude (DDMMSS) Longitude (DDDMMSS).

Depth of well and water level: Depth of well given in feet; reported water levels are in feet above (+) or below land surface; measured water levels are in feet and tenths.

Well diameter: casing diameter in inches.

Water-bearing unit: Qal, Alluvial-coastal aquifer; Tmu, Pliocene-Miocene aquifer.

Altitude of land surface: Altitudes given in feet above sea level, from topographic map or determined by anerold barometer.

Method of lift: S, submergible; T, turbine.

Use of well: N, none; P, public water supply.

Well number	Geographic coordinate number	Well owner	Driller and year drilled	Well depth (feet)	Well diam. (inches)	Water bearing unit	Altitude of land surface	Water level above (+) or below Land Surface Datum	Date measurement	Method of lift	Use of well	Remarks
1	3106140881420	South Alabama Utilities (Citronelle)	Layne-Central Co. 1958	762	16,8	Tmu	339	--	--	T	P	Casing: 16 in. from surface to 687 ft; 8 in. from 609 to 692 ft; screen from 692 to 752 ft. Reported drawdown 10 ft after 3 hrs pumping 400 gal/min in 1958.
2	3105330881449	South Alabama Utilities (Citronelle)	Carloss Well Supply Co. 1969	760	16,8	Tmu	335	--	--	T	P	Casing: 16 in. from surface to 685 ft; 8 in. from 633 to 696 ft; 8 in. screen from 696 to 758 ft. Reported drawdown 30 ft after 8 hrs pumping 500 gal/min.
3	3105290881341	South Alabama Utilities (Citronelle)	Layne-Central Co. 1953	745	16,8	Tmu	309	203	1953	T	P	Casing: 16 in. from surface to 650 ft; 8 in. from 570 to 655 ft; screen from 655 to 735 ft. Reported drawdown 18 ft after 8 hrs pumping 472 gal/min in 1953.
4	3104440881405	South Alabama Utilities (Citronelle)	Layne-Central Co. 1965	805	16,8	Tmu	334	252	1965	T	P	Casing: 16 in. from surface to 700 ft; 8 in. from 640 to 705 ft; screened and cased from 705 to 805 ft.
5	3105160880150	Searcy Hospital (State of Alabama)	Layne-Central Co. 1950	720	16,12	Tmu	185	128	1967	T	P	Casing: 16 in. from surface to 242 ft; 12 in. from 200 to 660 ft; 8 in. from 585 to 665 ft; 8 in. screen from 665 to 710 ft. Reported drawdown 39 ft after 5.5 hrs pumping 457 gal/min in 1950.

Table 2.--Records of public water-supply wells in the study area--Continued

Well number	Geographic coordinate number	Well owner	Driller and year drilled	Well depth (feet)	Well diam. (inches)	Water bearing unit	Altitude of land surface	Water level above (+) or below Land Surface Datum	Date measurement	Method of lift	Use of well	Remarks
6	3105160880146	Searcy Hospital (State of Alabama)	Acme Drilling Co. 1958	685	16,8	Tmu	166	101.9	1965	T	P	Casing: 16 in. from surface to 625 ft; 8 in. from 559 to 622 ft; 8 in. screen from 625 to 682 ft. Reported drawdown 21 ft after 24 hrs pumping 500 gal/min in 1958.
7	3105280880002	Mt. Vernon Water Dept.	Carloss Well Supply 1962	95	20,12	Qal	51	27	1962	T	P	Casing: 20 in. from surface to 60 ft; 12 in. from surface to 75 ft; 12 in. screen from 75 to 95 ft. Reported drawdown 10 ft after 8 hrs pumping 305 gal/min in 1962.
8	3105240880010	Mt. Vernon Water Dept.	Carloss Well Supply 1967	95	6	Qal	56	29.1	1967	T	P	Casing: 6 in. from surface to 75 ft; 6 in. screen from 75 to 95 ft. Reported drawdown 14 ft after 24 hrs pumping 406 gal/min in 1967.
9	3055070880207	LeMoyne Water System	Holland Well Co. 1982	130	20,12	Qal	31	20	5-82	T	P	Casing: 20 in. from surface to 107 ft; 12 in. from surface to 110 ft; 12 in. screen from 110 to 130 ft. Reported drawdown 10 ft after 24 hrs pumping 600 gal/min in 1981.
10	3054500880201	LeMoyne Water System	Holland Well Co. 1971	135	8,4	Qal	28	12	1973	T	P	Casing: 8 in. from surface to 102 ft; 4 in. from 90 to 105 ft; 4 in. screen from 105 to 135 ft. Reported drawdown 17 ft after 1 hr pumping 300 gal/min in 1973.
11	3054080880728	Turnerville Water & Fire Protection	Layne-Central Co. 1978	522	12,6	Tmu	240	--	--	T	P	Casing: 12 in. from surface to 480 ft; 6 in. from 405 to 482 ft; 6 in. screen from 482 to 512 ft. Reported drawdown 52 ft after 24 hrs pumping 517 gal/min in 1979.
12	3051310880344	Satsuma Water Works	Acme Drilling Co. 1979	127	14,10	Qal	25	10	1979	T	P	Casing: 14 in. from surface to 95 ft; 10 in. from 54 to 94 ft; 8 in. screen from 94 to 125 ft. Reported drawdown 15 ft after 10.5 hrs pumping 781 gal/min in 1979.

Table 2.--Records of public water-supply wells in the study area--Continued

Well number	Geographic coordinate number	Well owner	Driller and year drilled	Well depth (feet)	Well diam. (inches)	Water bearing unit	Altitude of land surface	Water level above (+) or below Land Surface Datum	Date measurement	Method of lift	Use of well	Remarks
13	3051250880313	Satsuma Water Works	Acme Drilling Co. 1964	117	12,8	Qal	20	20	1964	T	P	Casing: 12 in. from surface to 90 ft; 8 in. from 50 to 90 ft; 6 in. screen from 90 to 115 ft.
14	3051240880258	Satsuma Water Works	Alsay Inc. 1985	135	12,8	Qal	20	12	1985	T	P	Casing: 12 in. from surface to 91 ft; 8 in. from 58 to 100 ft; 6 in. screen from 100 to 130 ft. Reported drawdown 34.7 ft after 24 hrs pumping 457 gal/min in 1985.
15	3051240880303	Satsuma Water Works	Acme Drilling Co. 1964	129	12,8	Qal	18	20	1964	-	N	Casing: 12 in. from surface to 99 ft; 8 in. from 58 to 98 ft; 6 in. from 98.5 to 128.5 ft.
16	3050120880406	Saraland Water Service	Layne-Central Co. 1963	132	24,12	Qal	24	17.2	1967	T	P	Casing: 24 in. from surface to 95 ft; 12 in. from surface to 100 ft; 10 in. screen from 100 to 125 ft. Reported drawdown 19 ft after pumping 500 gal/min in 1963.
17	3049220880752	Mobile Water Service System	Layne-Central Co. 1962	235	18,10	Tmu	140	123.9	1967	T	N	Casing: 18 in. from surface to 200 ft; 10 in. from 160 to 205 ft; 8 in. screen from 205 to 225 ft. Reported drawdown 54 ft after 2 hrs pumping 166 gal/min in 1963.
18	3049130880757	Mobile Water Service System	Layne-Central Co. 1963	410	16,8	Tmu	152	182.6	1967	-	N	Casing: 16 in. from surface to 361 ft; 8 in. from 311 to 365 ft; 8 in. screen from 365 to 400 ft.
19	3050030881156	Kushla Water Authority	Holland Well Co. 1977	530	12,6	Tmu	125	66	1978	T	P	Casing: 12 in. from surface to 444 ft; 6 in. from 425 to 465 ft; 6 in. screen from 465 to 530 ft.
20	3050030881155	Kushla Water Authority	Holland Well Co. 1977	140		Tmu	230	88	1977	T	P	Screened from 110 to 140 feet. Pumping water level 118 ft at 167 gal/min.
21	3050030881156	Kushla Water Authority					230			-	N	Abandoned. No information.

Table 2.--Records of public water-supply wells in the study area--Continued

Well number	Geographic coordinate number	Well owner	Driller and year drilled	Well depth (feet)	Well diam. (inches)	Water bearing unit	Altitude of land surface	Water level above (+) or below Land Surface Datum	Date measurement	Method of lift	Use of well	Remarks
22	3049530881555	South Alabama Utilities (Semmes)	Holland Well Co. 1983	250	16,8	Tmu	260	57	1983	T	P	Casing: 16 in. from surface to 140 ft; 8 in. from 120 to 140 ft; 8 in. screen from 140 to 155 ft; 8 in casing from 155 to 215 ft; screen 215-220 ft; casing 220-230 ft; screen 230-250 ft.
23	3047210881756	Fairview Water & Fire	Carloss Well Supply Co. 1971	442	10,6	Tmu	222	112	1971	T	P	Casing: 10 in. from surface to 390 ft; 6 in. from 328 to 397 ft; 6 in. screen from 397 to 437 ft. Reported drawdown 32 ft after 8 hrs pumping 208 gal/min.
24	3046530881735	Fairview Water & Fire	Layne-Central Co. 1978	426	12,6	Tmu	208	96	1978	T	P	Casing: 12 in. from surface to 385 ft; 6 in. from 325 to 386 ft; 6 in. screen from 386 to 416 ft. Reported drawdown 68 ft after 24 hrs pumping 510 gal/min.
25	3049380880407	Saraland Water Service	Layne-Central Co. 1960	98	24,12	Qal	17	19.4	1967	T	P	Casing: 24 in. from surface to 60 ft; 12 in. from surface to 67 ft; screen from 67 to 92 ft. Reported drawdown 10 ft after pumping 732 gal/min in 1960.
26	3049450880334	Saraland Water Service	Layne-Central Co. 1980	126	24,12	Qal	15	62	1980	T	P	Casing: 24 in. from surface to 82 ft; 12 in. from surface to 86 ft; 10 in. from 86 to 116 ft. Reported drawdown 62 ft after pumping 650 gal/min for 72 hrs.
27	3045200880414	Saraland Water Service	Layne-Central Co. 1959	148	18,12	Qal	19	17.8	1967	T	P	Casing: 18 in. from surface to 105 ft; 12 in. from surface to 108 ft. Reported drawdown 38 ft after 8 hrs pumping 632 gal/min in 1959.
28	3042140881638	South Alabama Utilities (Semmes)	--	--	--	Tmu	210	--	--	-	-	No information.

Table 2.--Records of public water-supply wells in the study area--Continued

Well number	Geographic coordinate number	Well owner	Driller and year drilled	Well depth (feet)	Well diam. (inches)	Water bearing unit	Altitude of land surface	Water level (+) or below Land Surface Datum	Date measurement	Method of lift	Use of well	Remarks
29	3035160881223	Mobile County Water & Fire Protection	Layne-Central Co. 1959	490	12,8	Tmu	123	89.9	1967	T	P	Casing: 12 in. from surface to 445 ft; 8 in. from 385 to 450 ft; screen from 450 to 480 ft. Reported drawdown 35 ft after 8 hrs pumping 476 gal/min in 1959.
30	3035120881116	Mobile County Water & Fire Protection	Graves Well Drilling 1986	375	6	Tmu	162	--	--	T	P	No information.
31	3033200881026	Mobile County Water & Fire Protection	Layne-Central Co. 1967	476	6	Tmu	67	31.3	1967	T	P	Casing: 6 in. from surface to 464 ft; screen from 464 to 476 ft. Reported drawdown 15 ft after 1 hr pumping 222 gal/min in 1967.
32	3032560881118	Mobile County Water & Fire Protection	Layne-Central Co. 1967	515	8	Tmu	87	60	1967	T	P	Casing: 8 in. from surface to 495 ft; screen from 495 to 515 ft. Reported drawdown 24 ft after 4 hrs pumping 302 gal/min in 1967.
33	3033410881258	Mobile County Water & Fire Protection	Layne-Central Co. 1984	330	16,8	Tmu	170	105	1984	T	P	Casing: 16 in. from surface to 225 ft; 8 in from 175 to 230 ft; 8 in. screen from 230 to 250 ft; 8 in. casing from 250 to 285 ft; screen from 285 to 320 ft; 10 ft of tail pipe. Reported drawdown 24 ft after 8 hrs pumping 610 gal/min.
34	3031230881204	St. Elmo-Irvington Water Authority	Powell Drilling Co. 1980	262	16,8	Tmu	75	30	1981	T	P	Casing: 16 in. from surface to 216 ft; 8 in. from 196 to 218 ft; 8 in. screen from 218 to 258 ft; 4 ft of tail pipe. Reported drawdown 28.8 ft after 24 hrs pumping 495 gal/min.
35	3030110881511	St. Elmo-Irvington Water Authority	Holland Well Co. 1976	143	10,6	Tmu	135	38	1976	T	P	Casing: 10 in. from surface to 101 ft; 6 in. from 91 to 103 ft; 6 in. screen from 103 to 143 ft. Reported drawdown 31 ft after 24 hrs pumping 490 gal/min in 1976.

Table 2.--Records of public water-supply wells in the study area--Continued

Well number	Geographic coordinate number	Well owner	Driller and year drilled	Well depth (feet)	Well diam. (inches)	Water bearing unit	Altitude of land surface	Water level above (+) or below Land Surface Datum	Date measurement	Method of lift	Use of well	Remarks
36	303045088191 8	Grand Bay Water Works	Powell Drilling Co. 1981	140	16,8	Tmu	125	33	1981	T	P	Casing: 16 in. from surface to 105 ft; 8 in. from 59 to 109 ft; 8 in. screen from 109 to 134 ft; 6 ft of tail pipe. Reported drawdown 31 ft after 6 hrs pumping 412 gal/min.
37	3028390882041	Grand Bay Water Works	Acme Drilling Co. 1964	158	12,8,6	Tmu	102	57	1964	T	P	Casing: 12 in. from surface to 115 ft; 8 in. from 74 to 115 ft; 6 in. screen from 115 to 155 ft. Reported drawdown 13 ft after 5 hrs pumping 406 gal/min in 1964.
38	3028450881952	Grand Bay Water Works	Holland Well Co. 1974	143	10,8	Tmu	75	38	1975	T	P	Casing: 10 in. from surface to 103 ft; 8 in. from 104 to 144 ft. Reported drawdown 22 ft after 4 hrs pumping 1,200 ga/min.
39	3025450881508	Bayou La Batre Water Works	Layne-Central Co. 1980	335	24,16	Tmu	80	--	--	T	P	Casing: 24 in. from surface to 280 ft; 16 in. from 220 to 285 ft; 16 in. screen from 285 to 325 ft; 10 ft of tail pipe.
40	3026240881300	Bayou La Batre Water Works	Layne-Central Co. 1967	379	16,8	Tmu	72	--	--	T	P	Casing: 16 in. from surface to 325 ft; 8 in. from 286 to 329 ft; 8 in. screen from 329 to 369 ft. Reported drawdown 64 ft after 8 hrs pumping 500 gal/min.
41	3021480880657	Southeast Mobile Co. Water Authority	Holland Well Co. 1984	390	16,8	Tmu	10	4	1984	T	P	Casing: 16 in. from surface to 360 ft; 8 in. from 320 to 360 ft; 8 in. screen from 360 to 385 ft. Reported drawdown 55 ft after 24 hrs pumping 350 gal/min.
42	3015520880656	Dauphin Island Water Dept.	Layne-Central Co. 1967	253	16,8	Tmu	6.5	22.9	8-80	T	P	Casing: 16 in. from surface to 200 ft; 8 in. from 150 to 205 ft; 8 in. screens from 205 to 225 ft, and 233 to 245 ft. Reported drawdown 48 ft after 24 hrs pumping 239 to 296 gal/min in 1979.

Table 2.--Records of public water-supply wells in the study area--Continued

Well number	Geographic coordinate number	Well owner	Driller and year drilled	Well depth (feet)	Well diam. (inches)	Water bearing unit	Altitude of land surface	Water level above (+) or below Land Surface Datum	Date measurement	Method of lift	Use of well	Remarks
43	3015140880717	Dauphin Island Water Dept.	Layne-Central Co. 1962	305	16,8	Tmu	5.6	10.5	6-67	T	P	Casing: 16 in. from surface to 230 ft; 8 in. from 180 to 235 ft; 8 in. screens from 235 to 250 ft, and 285 to 295. Reported drawdown 45 ft after 12 hrs pumping 230 gal/min in 1979.
44	3015120880645	Dauphin Island Water Dept.	Layne-Central Co. 1955	312	16,8	Tmu	6.5	4.3	8-80	T	P	Casing: 16 in. from surface to 205 ft; 8 in. from 143 to 238 ft; 8 in. screens from 208 to 258 ft, and 208 to 303 ft. Reported drawdown 25 ft after 8 hrs pumping 225 gal/min in 1955.
45	3101480875108	Stockton Water Authority	Acme Drilling Co. 1973	208	12,8	Tmu	115	89	1974	T	P	Casing: 12 in. from surface to 169 ft; 8 in. from 128 to 168 ft; 6 in. screen from 168 to 199 ft.
46	3053030874708	Bay Minette Utility Bd.	Layne-Central Co. 1983	265	24,16	Tmu	269	82	1983	T	P	Casing: 24 in. from surface to 168 ft; 16 in. from 112 to 170 ft; 16 in. screens from 170 to 190 ft, and 205 to 255 ft; 10 ft of tail pipe. Reported drawdown 66 ft after 6 hrs pumping 1,000 gal/min in 1984.
47	3053050874629	Bay Minette Utility Bd.	Layne-Central Co. 1938	229	12,8	Tmu	269	90.4	1966	T	P	Casing: 12 in. from surface to 196 ft; 8 in. from 162 to 207 ft; 8 in. screen from 207 to 229 ft. Reported drawdown 41 ft after 24 hrs pumping 320 gal/min in 1938.
48	3052430874633	Bay Minette Utility Bd.	Layne-Central Co. 1948	204	18,12	Tmu	270	88.8	1966	T	P	Casing: 18 in. from surface to 148 ft; 12 in. from surface to 159 ft; 8 in. screen from 160 to 200 ft. Reported drawdown 23 ft after 8 hrs pumping 361 gal/min in 1948.

Table 2.--Records of public water-supply wells in the study area--Continued

Well number	Geographic coordinate number	Well owner	Driller and year drilled	Well depth (feet)	Well diam. (inches)	Water bearing unit	Altitude of land surface	Water level (+) or below Land Surface Datum	Date measurement	Method of lift	Use of well	Remarks
49	3052010874617	Bay Minette Utility Bd.	Layne-Central Co. 1974	185	24,12	Tmu	255	68	1975	T	P	Casing: 24 in. from surface to 130 ft; 12 in. from 80 to 135 ft; 10 in. screen from 135 to 175 ft. Reported drawdown 47 ft after pumping 750 gal/min.
50	3051450874620	Bay Minette Utility Bd.	Layne-Central Co.	185	24,12	Tmu	265	65	1966	T	P	Casing: 24 in. from surface to 130 ft; 12 in. from 80 to 134 ft; 10 in. screen from 135 to 175 ft. Reported drawdown 40 ft after pumping 500 gal/min.
51	3044340874731	Stapleton Water System	Powell Drilling & Service Co. 1964	112	12,8	Tmu	221	54	1966	T	P	Casing: 12 in. from surface to 94 ft; 8 in. from 70 to 95 ft; 6 in. screen from 95 to 111 ft. Reported drawdown 34 ft after 1.5 hrs pumping 125 gal/min in 1964.
52	3040240875244	Spanish Fort Water System	Layne-Central Co. 1964	309	16,8	Tmu	152	109.6	1966	T	P	Casing: 16 in. from surface to 260 ft; 10 in. from 210 to 265 ft; 8 in. screen from 265 to 305 ft. Reported drawdown 13 ft pumping 200 gal/min in 1965.
53	3040070875342	Spanish Fort Water System	Layne-Central Co. 1959	378	18,12	Tmu	170	163	3-87	T	P	Casing: 18 in. from surface to 289 ft; 12 in. from 239 to 294 ft; 8 in. screens from 294 to 319 ft, and 348 to 368 ft.
54	3039560875352	Spanish Fort Water System	Deep Well Drilling Co. 1950	335	12,6,4	Tmu	131	129	1966	-	N	Casing: 12 in. from surface to 90 ft; 6 in. from surface to 288 ft; 4 in. from 225 to 288 ft; 4 in. screen from 288 to 328 ft.
55	3039590875342	Spanish Fort Water System	Deep Well Drilling Co. 1947	341	8,6	Tmu	129	116	1947	-	N	Casing: 8 in. from surface to 128 ft; 6 in. from surface to 290 ft; 32 ft of 6 in. screen between 290 and 341 ft.

Table 2.--Records of public water-supply wells in the study area--Continued

Well number	Geographic coordinate number	Well owner	Driller and year drilled	Well depth (feet)	Well diam. (inches)	Water bearing unit	Altitude of land surface	Water level above (+) or below Land Surface Datum	Date measurement	Method of lift	Use of well	Remarks
56	3038290875356	Daphne Utility Bd.	Layne-Central Co. 1959	315	12,8	Tmu	140	48	1959	T	P	Casing: 12 in. from surface to 270 ft; 8 in. from 220 to 275 ft; 6 in. screen from 275 to 305 ft. Reported drawdown 23 ft after 8 hrs pumping 319 gal/min.
57	3038400875215	Daphne Utility Bd.	Layne-Central Co. 1972	305	16,10	Tmu	158	64	1972	T	P	Casing: 16 in. from surface to 240 ft; 10 in. from 190 to 245 ft; 8 in. screen from 245 to 295 ft. Reported drawdown 43 ft after 26 hrs pumping 575 gal/min.
58	3038090875219	Daphne Utility Bd.	Powell Drilling Co. 1982	176	16,10	Tmu	115	63	9-82	T	P	Casing: 16 in. from surface to 131 ft; 10 in. from 101 to 131 ft; 8 in. screen from 131 to 171 ft. Reported drawdown 34 ft after 24 hrs pumping 596 gal/min.
59	3039110875110	Malbis Plantation	Johnson Drilling & Inspecting Co.	265		Tmu	195			T	P	
60	3039100875110	Malbis Plantation	Holland Well Service 1983	260	16,8	Tmu	195	135	1983	T	P	Casing: 16 in. from surface to 208 ft; 8 in. from 200 to 210 ft; 8 in. screen from 210 to 260 ft. Reported drawdown 38 ft after 24 hrs pumping 509 gal/min.
61	3037230874504	Loxley Water Dept.	Layne-Central Co. 1959	184	12,8	Tmu	171	45.4	1966	T	P	Casing: 12 in. from surface to 140 ft; 8 in. from 100 to 144 ft; 8 in. screen from 144 to 174 ft. Reported drawdown 33 ft after 8 hrs pumping 305 gal/min in 1959.
62	3036240874507	Loxley Water Dept.	Holland Well Co. 1984	180	16,10	Tmu	165	55	7-84	T	P	Casing: 16 in. from surface to 139 ft; 10 in. from 90 to 140 ft; 8 in. screen from 140 to 180 ft. Reported drawdown 61 ft after pumping 24 hrs at 1,125 gal/min.

Table 2.--Records of public water-supply wells in the study area--Continued

Well number	Geographic coordinate number	Well owner	Driller and year drilled	Well depth (feet)	Well diam. (inches)	Water bearing unit	Altitude of land surface	Water level above (+) or below Land Surface Datum	Date measurement	Method of lift	Use of well	Remarks
63	3036420875255	Daphne Utility Bd.	Powell Drilling Co. 1984	198	18,12	Tmu	140	56	10-84	T	P	Casing: 18 in. from surface to 151 ft; 12 in. from 95 to 152 ft; 10 in. screen from 152 to 193 ft; 5 ft of tail pipe. Reported drawdown 23 ft after 8 hrs pumping 125 gal/min in 1984.
64	3036000875106	Daphne Utility Bd.	Acme Drilling Co. 1974	184	12,8	Tmu	145	53	1976	T	P	Casing: 12 in. from surface to 141 ft; 8 in. from 97.5 to 139 ft; 6 in. screens from 139 to 150 ft, and 161 to 181 ft.
65	3036060875408	Daphne Utility Bd.	Layne-Drilling Co. 1957	452	12,6	Tmu	157	132	1957	T	P	Casing: 12 in. from surface to 397 ft; 6 in. from 337 to 402 ft; 6 in. screen from 402 to 442 ft.
66	3036060875406	Daphne Utility Bd.	Layne-Central Co. 1963	452	12,6	Tmu	153	138.5	1966	T	P	Casing: 12 in. from surface to 397 ft; 6 in. from 352 to 402 ft; 6 in. screen from 402 to 442 ft. Reported drawdown 312 ft after pumping 250 gal/min in 1963.
67	3033170874247	Robertsdale Utilities	Layne-Central Co. 1944	260	16,8	Tmu	145	39.2	1966	T	P	Casing: 16 in. from surface to 98.5 ft; 8 in. from 77.5 to 122 ft; 8 in. screen 122 to 167 ft. Reported drawdown 34 ft after 4 hrs pumping 400 gal/min in 1944.
68	3033060874250	Robertsdale Utilities	Layne-Central Co. 1958	203	18,12	Tmu	145	37.7	1966	T	P	Casing: 18 in. from surface to 150 ft; 12 in. from 110 to 153 ft; 10 in. screen from 153 to 193 ft. Reported drawdown 41 ft after 3 hrs pumping 503 gal/min in 1959.
69	3032220874209	Robertsdale Utilities	Weldon Drilling Co. 1987	234	18,12	Tmu	138	39.5	6-87	-	N	Well has not been placed in operation. It will probably be in use by the end of 1988. Casing: 18 in. from surface to 148 ft; 12 in. from 98 to 148 ft; 10 in. screen from 150 to 210 ft.

Table 2.--Records of public water-supply wells in the study area--Continued

Well number	Geographic coordinate number	Well owner	Driller and year drilled	Well depth (feet)	Well diam. (inches)	Water bearing unit	Altitude of land surface	Water level above (+) or below Land Surface Datum	Date measurement	Method of lift	Use of well	Remarks
70	3032450874505	Silverhill Water Works	Acme Drilling Co. 1962	198	10,4	Tmu	145	50	1962	T	P	Casing: 10 in. from surface to 153 ft; 4 in. from 112 to 157 ft; 4 in. screen from 157 to 197 ft. Reported drawdown 8 ft after 8 hrs pumping 157 gal/min in 1962.
71	3032350874445	Silverhill Water Works	Acme Drilling Co. 1972	186	12,8,6	Tmu	141	--	--	T	P	Casing: 12 in. from surface to 153 ft; 8 in. from 111 to 152.8 ft; 6 in. from 152.8 to 163.1 ft; 6 in. screen 163.1 to 193.5 ft.
72	3031560875048	Fairhope Water Works	Layne-Central Co. 1952	479	16,10	Tmu	90	53	1952	-	N	Well has been plugged.
73	3031280875226	Fairhope Water Works	--	220	--	Tmu	113	--	--	-	N	Abandoned. No information.
74	3031170875410	Fairhope Water Works	Gray Artesian Well Co. 1935	216	20,10	Tmu	123	98	1949	-	N	Casing: 20 in. from surface to 90 ft; 10 in. from surface to 116 ft; 10 in. perforated pipe from 116 to 216.
75	3031220875412	Fairhope Water Works	Layne-Central Co. 1944	395	16,10	Tmu	120	82	1945	-	N	Casing: 16 in. from surface to 291 ft; 10 in. from 291 to 351 ft; 8 in. screens from 295 to 315 ft, and 355 to 385 ft. Reported drawdown 36 ft after 24 hrs pumping 200 gal/min in 1949.
76	3031250875409	Fairhope Water Works	Layne-Central Co. 1955	479	16,10	Tmu	106	78.2	1966	-	N	Casing: 16 in. from surface to 330 ft; 10 in. from 270 to 335 ft; screens from 335 to 365 ft, and 440 to 470 ft. Reported drawdown 35 ft after pumping 614 gal/min in 1955.
77	3031150875400	Fairhope Water Works	Layne-Central Co. 1964	510	20,12	Tmu	118	106	1963	-	N	Casing: 20. in from surface to 360 ft; 12 in. from 300 to 365 ft; 12 in. screens from 365 to 390 ft, and 455 to 500 ft. Reported drawdown 80 ft after 8 hrs pumping 752 gal/min in 1964.

Table 2.--Records of public water-supply wells in the study area--Continued

Well number	Geographic coordinate number	Well owner	Driller and year drilled	Well depth (feet)	Well diam. (inches)	Water bearing unit	Altitude of land surface	Water level above (+) or below Land Surface Datum	Date measurement	Method of lift	Use of well	Remarks
78	3028500875409	Fairhope Water Works	Layne-Central Co. 1981	230	20,14	Tmu	90	61	1982	T	P	Casing: 20 in. from surface to 110 ft; 14 in. from surface to 110 ft; 12 in. screens from 110 to 120 ft, 129 to 154 ft, and 195 to 220 ft; 10 ft of tail pipe. Reported drawdown 13 ft after 8 hrs pumping 748 gal/min in 1982.
79	3029350874900	Fairhope Water Works	Layne-Central Co. 1955	196	20,14	Tmu	102	81	10-81	T	P	Casing: 20 in. from surface to 126 ft; 14 in. from surface to 131 ft; 12 in. screen from 131 to 186 ft. Reported drawdown 14 ft after 6 hrs pumping 754 gal/min in 1982.
80	3029270874233	Summerdale Water Works	Layne-Central Co. 1955	146	16,10	Tmu	115	8.7	1966	T	P	Casing: 16 in. from surface to 71 ft; 10 in. from surface to 75 ft; 10 in. screens from 75 to 95 ft, 120 to 140 ft. Reported drawdown 20 ft after 8 hrs pumping 500 gal/min in 1955.
81	3024290874043	Foley-Riviera Utilities	Carloss Well Supply 1971	138	24,16	Tmu	75	22	1972	T	P	Casing: 24 in. from surface to 98 ft; 16 in. from surface to 95 ft; 12 in. screen from 98 to 138 ft. Reported drawdown 44 ft after 12 hrs pumping 625 gal/min in 1972.
82	3024150874100	Foley-Riviera Utilities	Layne-Central Co. 1954	148	16,10	Tmu	73	24	1966	T	P	Casing: 16 in. from surface to 94 ft; 10 in. from 64 to 98 ft; 10 in. screen from 98 to 138 ft. Reported drawdown 32 ft after 8 hrs pumping 503 gal/min in 1954.
83	3024130874050	Foley-Riviera Utilities	Layne-Central Co. 1962	157	24,12	Tmu	73	18	1962	T	P	Casing: 24 in. from surface to 103 ft; 16 in. from surface to 106 ft; 12 in. screen from 106 to 131 ft. Reported drawdown 48 ft after 8 hrs pumping 578 gal/min in 1962.

Table 2.--Records of public water-supply wells in the study area--Continued

Well number	Geographic coordinate number	Well owner	Driller and year drilled	Well depth (feet)	Well diam. (inches)	Water bearing unit	Altitude of land surface	Water level (+) or below Land Surface Datum	Date measurement	Method of lift	Use of well	Remarks
84	3024580873603	Elberta Water Works	Spillers Well & Pump 1964	102	8,6	Tmu	75	26	1964	T	P	Casing: 8 in. from surface to 72 ft; 6 in. from 69 to 72 ft; 6 in. screen from 72 to 102 ft. Reported drawdown 30 ft after 2 hrs pumping 335 gal/min in 1964.
85	3024570873600	Elberta Water Works	Layne-Central Co. 1954	102	8,6	Tmu	70	20.2	1966	-	N	Casing: 8 in. from surface to 70 ft; 6 in. from 68 to 70 ft; 6 in. screen from 70 to 100 ft.
86	3024160872727	Spanish Cove Water & Sewer	Layne-Central Co. 1974	280	18,10	Tmu	67	31	1976	T	P	Casing: 18 in. from surface to 235 ft; 10 in. from 185 to 240 ft; 10 in. screen from 240 to 270 ft. Reported drawdown 37 ft after 5 hrs pumping 457 gal/min in 1976.
87	3023030872845	Perdido Bay Water, Sewer & Fire Protection Authority	Layne-Central Co. 1977	310	18,10	Tmu	65	46	1977	T	P	Casing: 18 in. from surface to 255 ft; 10 in. from 205 to 260 ft; 10 in. screen from 260 to 300 ft. Reported drawdown 38 ft after 8 hrs pumping 500 gal/min in 1977.
88	3019330874028	Gulf Shores Water Works	Alsay Inc. 1984	400	20,10	Tmu	40	16	1984	-	N	Well #5. Casing: 20 in. from surface to 265 ft; 10 in. from 216 to 270 ft; 10 in. screen from 270 to 320 ft. Reported drawdown 116 ft after 3 days pumping 1,500 gal/min in 1984.
89	3018410874056	Gulf Shores Water Works	Layne-Central Co. 1979	215	20,12	Tmu	33	26	6-79	T	P	Well #4. Casing: 20 in. from surface to 170 ft; 12 in. from 120 to 175 ft; 10 in. screen from 175 to 205 ft; 10 ft of lap pipe. Reported drawdown 132 ft after 24 hrs pumping 750 gal/min in 1979.
90	3018410874150	Gulf Shores Water Works	Alsay Inc. 1984	218	20,12	Tmu	40	34	8-84	T	P	Well #6. Casing: 20 in. from surface to 160 ft; 12 in. from 103 to 163 ft; 10 in. screen from 163 to 213 ft. Reported drawdown 125 ft after 3 days pumping 1,209 gal/min in 1984.

Table 2.--Records of public water-supply wells in the study area--Continued

Well number	Geographic coordinate number	Well owner	Driller and year drilled	Well depth (feet)	Well diam. (inches)	Water bearing unit	Altitude of land surface	Water level above (+) or below Land Surface Datum	Date measurement	Method of lift	Use of well	Remarks
91	3018180874221	Gulf Shores Water Works	Alsay Inc. 1986	203	16,10	Tmu	10	13	2-86	T	P	Well #7. Casing: 16 in. from surface to 148 ft; 10 in. from 108 to 148 ft; 10 in. screen from 148 to 198 ft; 5 ft of tail pipe. Reported drawdown 97 ft after 12 hrs pumping 110 gal/min in 1986.
92	3017270873902	Orange Beach Water & Fire Protection Authority	Carloss Well Supply 1974	144	12,8	Tmu	25	16	1974	T	P	Casing: 12 in. from surface to 100 ft; 8 in. from 60 to 120 ft; 8 in. screen from 120 to 140 ft; 4 ft of tail pipe.
93	3017490873957	Alabama Gulf Utilities	Acme Drilling Co. 1983	140	12	Tmu	10	10	8-87	T	P	Casing: 12 in. from surface to 100 ft; 12 in. screen from 100 to 140 ft.
94	3017180873804	Alabama Gulf Utilities	Acme Drilling Co. 1983	408	16,10	Tmu	10	flowing 16	11-83 8-87	T	P	Casing: 16 in. from surface to 331 ft; 10 in. from 292 to 331 ft; 8 in. screen from 331 to 407 ft. Reported drawdown 17.5 ft after 15 hrs pumping 500 gal/min in 1983.
95	3017180873803	Orange Beach Water & Fire Protection Authority	Graves Well Drilling 1981	120	18,10	Tmu	10	5.7	6-81	T	P	Casing: 18 in. from surface to 100 ft; 10 in. from surface to 100 ft; 10 in. screen from 100 to 120 ft. Reported drawdown about 25 ft after 5 days pumping 503 gal/min in 1981.
96	3017320874107	Gulf Shores Water Works	Layne-Central Co. 1978	215	20,12	Tmu	16	26	6-79	T	P	Well #3. Casing: 20 in. from surface to 170 ft; 12 in. from 120 to 175 ft; 10 in. screen from 175 to 205 ft. Reported drawdown 132 ft after 24 hrs pumping 750 gal/min in 1979.
97	3016290874110	Gulf Shores Water Works	Layne-Central Co. 1967	138	20,12	Tmu	10	11	1987	T	P	Well #2. Casing: 20 in. from surface to 100 ft; 12 in. from surface to 102 ft; 10 in. screen from 103 to 128 ft. Reported drawdown 11 ft pumping 503 gal/min.
98	3016060874113	Gulf Shores Water Works	Layne-Central Co. 1955	98	16,10	Tmu	14	11	1987	T	P	Well #1. Casing: 16 in. from surface to 68 ft; 10 in. from surface to 78 ft; 10 in. screen from 72 to 93 ft. Reported drawdown 15 ft after 8 hrs pumping 150 gal/min in 1955.

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