WATER AVAILABILITY OF WASHINGTON COUNTY, ALABAMA

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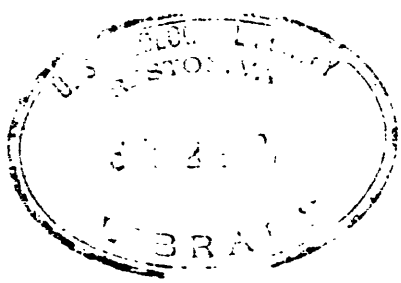
ABSTRACT

Large quantities of ground water and surface water are available in Washington County. Major sources of ground water are the Gosport Sand and Lisbon Formation undifferentiated, the Oligocene Series undifferentiated, the Miocene Series undifferentiated, and alluvium and low terrace deposits. The Miocene, the most productive source of ground water, will yield 0.5 to 1.0 mgd (million gallons per day) per well and is a potential source of larger supplies in most of the county. The quantity of potable water available is governed largely by geologic structures.

Average flows of the Tombigbee and Mobile Rivers in the southeast corner of the county are 18,200 and 39,400 mgd. Average runoff originating in the county is about 1,100 mgd or 1 mgd per square mile.

Water in aquifers tapped by wells generally contains less than 500 mg/l (milligrams per liter) dissolved solids. The water generally is soft to moderately hard. Water in streams is soft to moderately hard and low in dissolved solids. Estimated water use in 1966 was 43.5 mgd of which 10.9 mgd was ground water and 32.6 mgd was surface water.



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A ground-water availability map shows by color the aquifers underlying an area and the quantity of water available. Also on the map are contours showing the estimated depth below sea level of the base of water containing dissolved solids of 1,000 mg/l or less. Also included is a map showing by width of color pattern the average flow of streams in million gallons per day and by color the range in 7-day low flow in million gallons per day.

INTRODUCTION

Washington County comprises an area of 1,069 square miles in southwest Alabama. It is bounded on the north by Choctaw County, on the east by Clarke County, on the south by Mobile County, and on the west by the State of Mississippi. The population of Washington County, according to the 1960 census, is 15,372. Chatom, the county seat, has a population of 993. The climate and soils in the county are favorable for the growth of a variety of crops but most of the land is covered by pine and hardwood forests. The economy of the county is based primarily on timber, pulpwood, and chemical industries. Most major industries are located in the southeast part of the county near McIntosh.

Investigation and Purpose

The investigation of the availability of water in Washington County is a part of a larger study of the geology and availability of water resources in Alabama begun in 1963. The study is being made by the U.S. Geological Survey in cooperation with the Geological Survey of Alabama. The overall study was designed to appraise and describe the water availability of river basins or areas identified by political boundaries. The State was divided into seven areas corresponding to major river basins and the work was planned and conducted with the results to be published on the basis of county units. The seven areas and the status of studies in each are shown in figure 1. This report

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is one of eight water availability reports being prepared as part of the study, Water Resources of Southwest Alabama (Ala-31-C).

The purpose of this report is to present basic water-resources information in such a way that a quick visual appraisal and comparison with other county areas can be made by people interested in the development of water resources.

Figure 1.--Status of geologic and water availability studies in Alabama.

Previous Work

A limited amount of water-resources information for Washington County is included in publications resulting from regional or statewide studies. LaMoreaux (1948) included information for wells and chemical analyses of ground water; and a report by Peirce (1966) contains information for streams in Washington County and includes information on present and future development of surface-water supplies, hydrologic environment, and streamflow characteristics. The latter report contains a section on the quality of surface water by Rogers (1966). A statewide report by Peirce (1967) contains low-flow and flow-duration data for selected streams in Washington County.

Acknowledgments

Acknowledgment is made to well owners, industrial personnel, and city officials for supplying water-resources information that contributed to this report. Special appreciation is expressed to drillers and contractors including Acme Drilling Co., Fowler Butane Co., Haertel Well Service, Layne-Central Co., Robert Layton, Peeples Drilling Co., and Presnall and Son Drilling Co. for supplying drillers' logs, sample cuttings, and well construction and water-level data.

OCCURRENCE OF WATER

The source of all fresh water in Washington County is precipitation which occurs mainly in the form of rain. Annual rainfall averages about 59 inches and is fairly evenly distributed throughout the year. Part of the rainfall runs off directly into streams; part replenishes soil moisture but is returned to the atmosphere by evapotranspiration; and part percolates downward below the soil zone to replenish underground reservoirs. The average annual runoff originating in the county is about 22 inches which is equivalent to 1,100 mgd (million gallons per day) or 1 mgd per square mile. Annual recharge to underground reservoirs is estimated to exceed 8 inches.

The occurrence of ground water and low flow of streams in Washington County is governed largely by the physical characteristics of geologic units. Geologic units that crop out in and north of Washington County contain beds of permeable sand and limestone that serve as natural conduits and reservoirs for water. These permeable beds, called aquifers, dip southwestward and are sources of water for wells; in their areas of outcrop the aquifers also provide the low flow of streams. Where aquifers are overlain by relatively impermeable beds, water in them becomes confined under pressure. Such aquifers are termed artesian and the surface to which the water will rise under artesian pressure is called the potentiometric surface. Water in a well tapping a confined aquifer will rise above the top of the aquifer and in lowland areas will flow at land surface.

The occurrence of ground water in Washington County is also governed by structural deformation of underlying geologic units. The Hatchetigbee anticline and Jackson fault, the largest fold and fault exposed at land surface in the Coastal Plain of Alabama, are located along the northeast and east boundaries of the county, respectively. Other large folds and faults in the subsurface are also responsible for variations in the depth to major sources of ground water. The anomalous occurrence of mineralized ground water is also related to folding and faulting. This occurrence is due either to retardation of water movement and the resulting lack of flushing or to recharge through faults from deeper aquifers containing mineralized water. Mineralized water generally occurs at shallower depths in areas underlain by the geologic structures. This relationship and the location of geologic structures is shown in figure 2.

Figure 2 (caption on next page) belongs near here.

Figure 2.--Availability of ground water in Washington County, Alabama.

AVAILABILITY OF WATER

Ground Water

Large quantities of ground water are available from permeable sand and limestone beds in all but the northeast part of Washington County. Geologic units containing permeable sand or limestone beds that yield water to wells range in age from Eocene to Holocene. The thickness, lithology, and yield of geologic units underlying the county are summarized in table 1. The locations of wells tapping the units are shown in figure 2 and data for the wells are tabulated in table 2. Also shown in figure 2 are major geologic structures, the estimated base of water with a dissolved-solids content of 1,000 mg/l (milligrams per liter) or less, and a generalized geohydrologic ~~cross~~ section.

Geologic structures are responsible for irregular depths at which aquifers occur in several areas and are related to the irregular occurrence of highly mineralized water. This report is designed primarily to evaluate aquifers between the land surface and the base of water with a dissolved-solids content of 1,000 mg/l or less. For purposes of discussion in this report, water with a dissolved-solids content of 1,000 mg/l or less is considered to be "fresh water." The base of fresh water does not conform with the top of aquifers containing highly mineralized water; however, the two horizons are closely related in some areas underlain by major geologic structures. In most of Washington County, the degree of mineralization of ground water increases gradually with depth. Water with dissolved solids exceeding 1,000 mg/l is used where more suitable water is not available.

Aquifers containing fresh water will yield or are potential sources of 0.5 to 2.0 mgd or more per well in all but the northeast part of the county. The estimated quantity available in different areas is shown in figure 2. Major sources of water are aquifers in the Gosport Sand and Lisbon Formation undifferentiated, Oligocene Series undifferentiated, Miocene Series undifferentiated, and alluvium and low terrace deposits. The principal source of ground water in Washington County is the Miocene Series undifferentiated. It will yield 0.5 to 1.0 mgd per well in all but northern and eastern parts of the county and may yield as much as 2 mgd per well in central and southern parts of the county.

The ground water availability map (fig. 2) shows by contours the estimated depth, in feet below mean sea level, of the base of fresh water. To estimate the depth necessary to drill a well that will tap all aquifers above this horizon, add the altitude above mean sea level of the proposed well site to the contour line nearest this site. For example, the altitude of the land surface at Millry is about 115 feet and the depth given for the nearest contour line is 600 feet; therefore, the approximate depth for a well at that site would be 715 feet.

Ground water adequate for domestic use generally can be obtained at depths of 100 feet or less below land surface except in the vicinities of Chatom, St. Stephens, and Frankville. In those areas adequate quantities for domestic use generally can be obtained at depths of 100 to 300 feet.

Surface Water

The average flow and low flow of a stream are useful parameters in evaluating the availability of surface water. The long-term average flow of a stream is a measure of the total surface-water yield of a basin. A reasonable balance of wet and dry years requires about 20 years of streamflow record for adequate definition. The long-term average flows in Washington County are adjusted to the base period 1944-65 for this report. The 7-day Q_2 is an index of a stream's low flow character. The 7-day Q_2 is defined as the lowest average rate of flow for 7 consecutive days occurring at an average interval of 2 years. The 7-day Q_2 has a 50 percent probability of being exceeded in a given year and is used as an index of normal annual low flow. Low and high flows have a tendency to repeat; consequently, minimum flows may be less than or more than the 7-day Q_2 for several consecutive years. Data for streams in Washington and adjacent counties indicate that minimum flows of many streams are about 50 percent of the 7-day Q_2's, although some streams in the county cease to flow during dry weather. For example, Escatawpa River at Deer Park has been observed essentially dry on three different occasions since 1960. Average flows and 7-day Q_2's for streams in the county are shown on figure 3.

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Figure 3.--Streamflow in Washington County, Alabama.

The Tombigbee and Mobile Rivers are the principal sources of surface water in Washington County. The average flow of the Tombigbee is 16,400 mgd where it enters the county and 18,200 mgd near its junction with the Alabama River. The 7-day Q_2 for the Tombigbee near Leroy is 1,230 mgd. The average flow of the Mobile River below the junction of the Tombigbee and Alabama Rivers is 39,400 mgd, and about 5 miles to the south in Mobile County, the 7-day Q_2 is 7,750 mgd. Some tributaries of the Tombigbee are potential sources of significant quantities of water. Bassetts and Santa Bogue Creeks have average flows of 126 and 152 mgd and 7-day Q_2's of 9.7 and 9 mgd at stations nearest their junction with the Tombigbee. Smaller tributaries to the Tombigbee River, which include Lewis, Bilbo, and Bates Creeks, have average flows generally ranging from 50 to 100 mgd. The 7-day Q_2 of Bates Creek near Malcolm is 1.6 mgd. These streams probably go dry in their upstream reaches during periods of drought.

Escatawpa River drains the southwest part of the county. At Deer Park it has an average flow of 197 mgd but has a 7-day Q_2 of only 0.1 mgd.

QUALITY OF WATER

Water of suitable chemical quality for most uses is available in streams and aquifers in Washington County. Mineral constituents in solution and characteristics of water that are the primary concern of many water users are iron, chloride, dissolved solids, and hardness. Other constituents or characteristics may restrict its use for some purposes. Iron in water in excess of 0.3 mg/l is undesirable for many uses because it may cause staining. Water with a chloride content of less than 250 mg/l generally is desirable for domestic and municipal use as water containing greater amounts may impart a salty taste and may induce corrosion. In Washington County, chloride is one of the principal constituents in water containing dissolved solids in excess of 1,000 mg/l. Hard water is objectionable for some uses because it increases soap consumption and may deposit scale in pipes and boilers; soft water under certain conditions may induce corrosion. General terms used in this report to describe the hardness of water are as follows: soft, 0-60 mg/l; moderately hard, 61-120 mg/l; hard, 121-180 mg/l; and very hard, 181 mg/l or more.

Ground Water

Wells tapping aquifers in Washington County yield water of suitable quality for many uses. The dissolved-solids content is generally less than 500 mg/l and the temperature ranges from 19° C (Celsius) at shallow depths to 26° C at a depth of 2,000 feet. Specific conductances indicate that dissolved solids in water from wells tapping the Miocene Series undifferentiated, the principal source of ground water in the county, is generally less than 100 mg/l.

Iron in water in excess of 0.3 mg/l generally occurs in the Miocene Series undifferentiated and occurs locally in most other aquifers in the county. The water is generally soft to moderately hard except in geologic units containing calcareous sediments. These units, including the Hatchetigbee Formation, Gosport Sand and Lisbon Formation undifferentiated, Jackson Group, and Oligocene Series undifferentiated, commonly yield water that is hard to very hard.

The depth in feet below mean sea level of the base of water containing dissolved solids of 1,000 mg/l or less is shown by contours in figure 2. Highly mineralized water is obtained from wells in lowland areas in the Tombigbee River basin. The principal constituents are sodium, bicarbonate, and chloride. Wells B-2 and J-1 (fig. 2) tapping the Hatchetigbee Formation(?) yield water with chloride contents of 4,400 and 12,800 mg/l. In addition to the wells yielding highly mineralized water, Barksdale (1929, p. 8) reported "salt" seeps in the northern part of Washington County in the Tombigbee River basin.

Chemical analyses of water from wells and springs in Washington County are tabulated in table 3 and the quality of water available in the various geologic units is described in table 1.

Surface Water

Water in streams in Washington County is generally of suitable chemical quality for most uses. The dissolved-solids content of water in the Tombigbee River exceeds that in other streams in the county. Dissolved solids in water at the station Tombigbee River near Jackson from October 1965 to September 1967 ranged from approximately 60 to 160 mg/l and averaged about 95 mg/l. Water in the Tombigbee is generally soft. Water in the Mobile River south of the junction of the Tombigbee and Alabama Rivers in Washington County is similar in quality to that in the Tombigbee. Water in tributaries to the Tombigbee River in Washington County is soft and specific conductances indicate dissolved-solids contents that are less than 65 mg/l. Chemical analyses of water from selected streams in the county are tabulated in table 3.

Temperature of water in the Tombigbee River near Jackson has been recorded continuously since October 1962. During the period 1962-67, temperatures ranged from 6° C to 30° C and, during the water year October 1966 to September 1967, average monthly temperatures ranged from 9° C in January to 27° C in June (U.S. Geological Survey, Water Resources Data for Alabama, Part 2, Water Quality Records, 1967, p. 40-42).

WATER USE

All municipal and domestic water supplies and a substantial part of the supply used for livestock and industry are obtained from groundwater reservoirs. The largest amount of water used in the county, about 32 mgd, is taken from the Tombigbee River for the chemical industry. The estimated water use from all sources in Washington County is 43.5 mgd. This is far less than 1 percent of the average streamflow in the county. The estimated average daily use of water in Washington County in 1966 is as follows:

Use	Million gallons per day	
	Ground water	Surface water
Rural (domestic, livestock, school)	0.9	0.2
Municipal	.5	---
Industrial	9.5	32.4
	10.9	32.6

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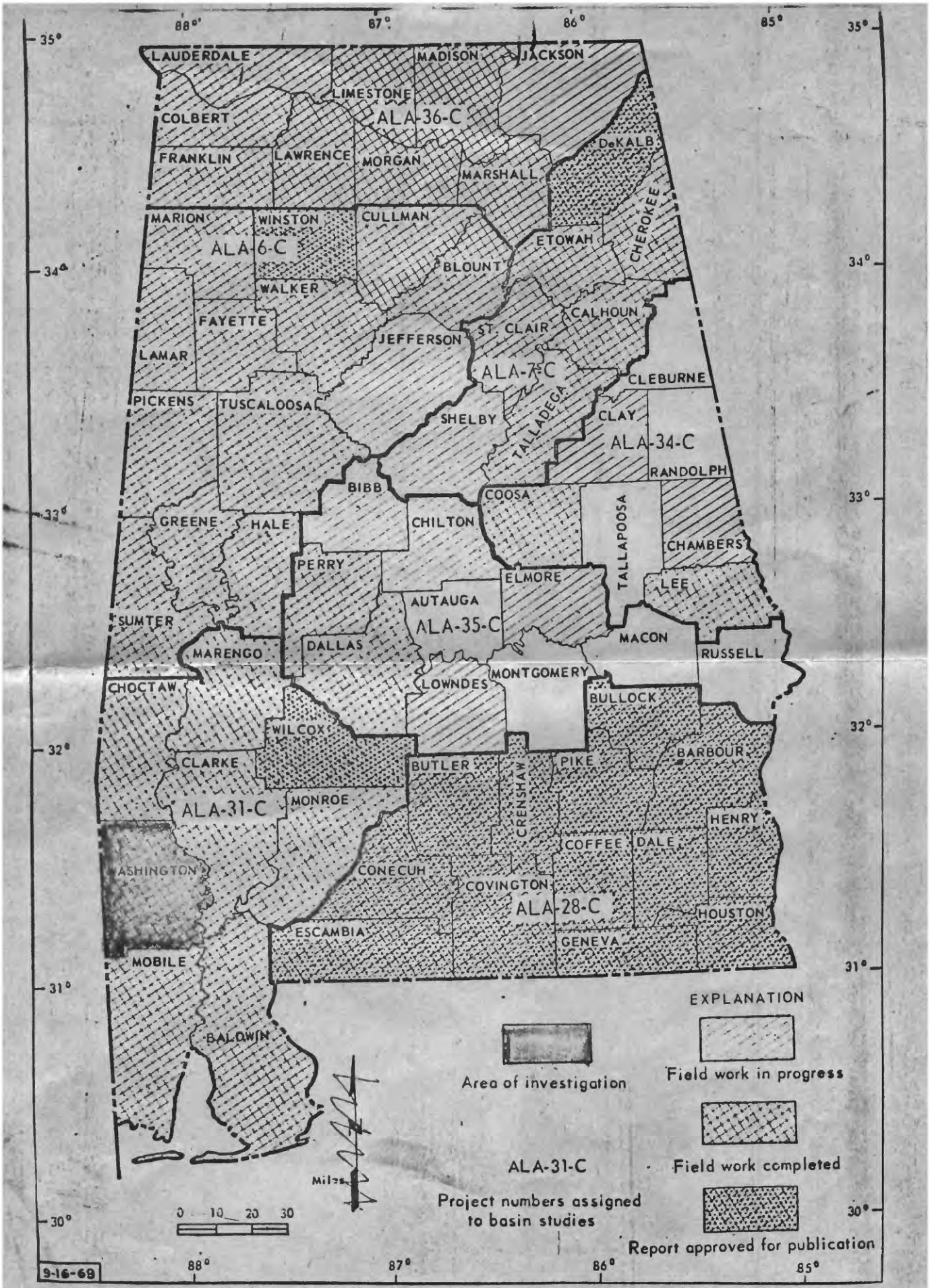

Figure 1.--Status of geologic and water availability studies in Alabama.

Table 2.--Records of wells and springs in Washington County, Alabama

Water-bearing unit: Th, Hatchetigbee Formation; Tt, Tallahatta Formation; Tgl, Gosport Sand and Lisbon Formation undifferentiated; Tj, Jackson Group; Tou, Oligocene Series undifferentiated; Tmu, Miocene Series undifferentiated; Qt, high terrace deposits; Qal, alluvium and low terrace deposits.

Altitude: Altitudes determined by aneroid barometer or from topographic maps.

Water level: Reported levels given in feet; measured levels given in feet and tenths.

Method of lift: C, centrifugal; F, flow; J, jet; ~~M, manual; P, piston;~~ S, submergible; T, turbine.

Use of water: D, domestic; Ind, industrial; N, none; PS, public supply; S, stock.

Number	Owner	Driller	Year completed	Depth of well (feet)	Diameter of well (inches)	Water-bearing unit	Altitude of land surface (feet)	Water level		Method of lift	Use of water	Remarks
								Above (+) or below land surface (feet)	Date of measurement			
A-1	C. Braun.....	.....	...	...	4	Th	135	...	...	F	N	Casing: hollow log. Well reportedly used by Indians as source of salt. Measured flow 1.2 gpm on 4-15-67.
A-2	R. L. Butts.....	.....	1916	20	24	Tgl	121	13.8	4-15-67	J	D	Casing: 24-in from surface to 20 ft.
B-1	S. A. Moorer.....	Fowler Butane Co...	1954	95	2	Tt	174	46	1954	J	D	Casing: 2-in from surface to 90 ft; 2-in screen from 90 to 95 ft.
B-2	Joe Dumas.....	.....	...	...	4	Th(?)	120	...	...	F	N	Casing: hollow log. Well reportedly used by Indians as source of salt. Estimated flow 0.3 gpm on 4-15-67.
B-3	Earl Johnston.....	H. A. Presnall and Son Drilling Co.	1965	90	4	Tgl	165	70	1965	C	D	Casing: 4-in from surface to 85 ft; 4-in screen from 85 to 90 ft.
B-4	.....do.....	W. L. Boone Drilling Co.	1966	270	4	Tgl, Th(?)	150	30	1966	C	D	Casing: 4-in from surface to 65 ft; none below.

Table 2.--Records of wells and springs--Continued in Washington County, Alabama.

Number	Owner	Driller	Year completed	Depth of well (feet)	Diameter of well (inches)	Water-bearing unit	Altitude of land surface (feet)	Water level		Method of lift	Use of water	Remarks
								Above (+) or below land surface (feet)	Date of measurement			
B-5	Earl Johnston.....	W. L. Boone Drilling Co.	...	290	4	Tgl, Th(?)	147	...	...	J	D	Casing: 4-in from surface to 60 ft; none below.
B-6	Oscar Braun.....	Oscar Braun.....	1936	276	4	Tgl	137	20	1936	C	D	Casing: 4-in from surface to 80 ft; none below.
B-7	T. R. Grimes.....	Robert Laton Drilling Co.	1961	65	2	Tmu	190	20	1961	J	D	Casing: 2-in from surface to 60 ft; 2-in screen from 60 to 65 ft.
C-1	H. J. Lassiter....	Peoples Drilling Co.	1957	500	4	Tgl	160	...	...	F	S	Casing: 4-in from surface to 80 ft; none below. Measured flow 1.5 gpm on 4-15-67.
C-2	.....do.....	Downing Drilling Co.	1950	220	4	Tj, Tgl	155	8	1965	J	D	Casing: 4-in from surface to 40 ft; none below. Well flowed prior to 1964.
C-3	Harold Blount.....	Harold Blount.....	1952	57	2	Tmu	180	21	1952	J	D	Casing: 2-in from surface to 52 ft; 2-in screen from 52 to 57 ft.
C-4	A. I. Brown.....	Adams Drilling Co...	1951	150	4	Tou	125	15	1951	C	D	Casing: 4-in from surface to 140 ft; none below.
C-5	Town of Millry....	Layne-Central Co....	1963	248	12, 6	Tou	120	+7	1963	F,T	P	Casing: 12-in from surface to 223 ft; 6-in from 183 to 228 ft; 6-in screen between 228 and 248 ft. Reported drawdown 69 feet after 8 hours pumping 100 gpm in 1963. Measured flow 4.7 gpm on 4-15-67. Reported average pumpage 17,500 gpd in 1966.

Table 2.--Records of wells and springs in Washington County, Alabama--Continued

Number	Owner	Driller	Year completed	Depth of well (feet)	Diameter of well (inches)	Water-bearing unit	Altitude of land surface (feet)	Water level		Method of lift	Use of water	Remarks
								Above (+) or below land surface (feet)	Date of measurement			
D-1	Emory Becton.....	Fowler Butane Co...	1955	82	2	Tmu	340	51	1955	J	D	Casing: 2-in from surface to 76 ft; 2-in screen from 76 to 82 ft.
D-2	Rodick Dearmon.....	.....do.....	1960	35	2	~~Qal(?)~~ Tmu	130	...	...	F	H	Casing: 2-in from surface to 30 ft; 2-in screen from 30 to 35 ft. Measured flow 37.5 gpm on 4-15-67.
D-3	Mrs. W. S. Knight..	.....	...	...	...	Tmu	128	...	...	F	D	Known as Healing Spring. Originally supplied health resort. Measured flow 4.4 gpm on 4-15-67.
D-4	R. H. Tucker.....	Peoples Drilling Co.	1953	80	2	Tmu	295	35	1953	J	D,S	Casing: 2-in from surface to 76 ft; 2-in screen from 76 to 80 ft.
D-5	V. V. Kirkland.....	Porter Drilling Co..	1963	47	2	Tmu	210	37	1963	J	D	Casing: 2-in from surface to 41 ft; 1¼-in screen from 41 to 47 ft.
D-6	E. T. Causey.....	Robert Laton Drilling Co.	1960	55	2	Tmu	280	38	1960	C	D	Casing: 2-in from surface to 50 ft; 2-in screen from 50 to 55 ft.
E-1	J. H. Odom.....	Terry Brothers Drilling Co.	1946	466	3	Tou, Tj, Tgl	410	60	1946	C	D,S	Casing: 3-in from surface to 200 ft; none below.
E-2	.....do.....	Dozier Drilling Co.	1964	110	2	Tmu	390	85	1964	J	S	Casing: 2-in from surface to 105 ft; 2-in screen from 105 to 110 ft;

Table 2.--Records of wells and springs in Washington County, Alabama.--Continued

Number	Owner	Driller	Year completed	Depth of well (feet)	Diameter of well (inches)	Water-bearing unit	Altitude of land surface (feet)	Water level		Method of lift	Use of water	Remarks
								Above (+) or below land surface (feet)	Date of measurement			
E-3	J. H. Odom.....	Peoples Drilling Co.	1950	116	2	Tmu	300	61	1950	C	D	Casing: 2-in from surface to 111 ft; 2- screen from 111 to 116 ft.
G-1	Mrs. Agusta Sullivan	Fowler Butane Co....	1956	215	2	Tmu	190	60	1956	J	D	Casing: 2-in from surface to 210 ft; 2- screen from 210 to 215 ft.
G-2	J. T. Carter.....	Robert Laton Drilling Co.	1963	69	2	Tmu	290	26	1963	J	D	Casing: 2-in from surface to 64 ft; 2- screen from 64 to 69 ft.
G-3	Mrs. Hattie Sanders	Fowler Butane Co....	1955	195	2	Tmu	210	57	1955	J	D	Casing: 2-in from surface to 189 ft; n below.
G-4	Ernest Odom.....	Thrash Drilling Co.	1965	320	2	Tmu, Tou(?)	263	80	1965	J	D,S	Casing: 2-in from surface to 312 ft; 2- screen from 312 to 320 ft.
H-1	M. L. Dixon.....	Robert Laton Drilling Co.	1966	270	4	Tmu	125	+0.1	4-15-67	J	D	Casing: 4-in from surface to 250 ft; n below.
H-2	L. A. Thompson	.....do.....	1960	75	2	Tmu	290	20	1960	J	D	Casing: 2-in from surface to 70 ft; 2- screen from 70 to 75 ft.
J-1	Earl Johnson.....	.....	1950	2,000	6	Th(?)	96	...	...	F	N	Abandoned oil test well. Measured flo on 4-15-67.
J-2	Lone Star Cement Co.	Lone Star Cement Co.	1955	60	3	Tj	65	32	1955	J	I	Casing: 3-in from surface to 55 ft; 3- screen from 55 to 60 ft.
J-3	Douglas Palmer.....	H. A. Presnall and Son Drilling Co.	1956	340	4	Tou, Tj,Tgl(?)	215	68	1956	C	D	

Table 2.--Records of wells and springs in Washington County, Alabama--Continued

Number	Owner	Driller	Year completed	Depth of well (feet)	Diameter of well (inches)	Water-bearing unit	Altitude of land surface (feet)	Water level		Method of lift	Use of water	Remarks
								Above (+) or below land surface (feet)	Date of measurement			
J-4	H. M. Wilson.....	.....	1962	350	4	Tou, Tj, Tgl(?)	245	100	1962	S	D	Casing: 4-in from surface to 250 ft; none below.
J-5	C. J. Alston.....	H. A. Presnall and Son Drilling Co.	1958	60	2	Tmu	220	...	...	J	D	Casing: 2-in from surface to 55 ft; 2-in screen from 55 to 60 ft.
J-6	Coleman Moseley...	Robert Laton Drilling Co.	1963	55	2	Tmu	185	28	1963	J	D	Casing: 2-in from surface to 50 ft; 2-in screen from 50 to 55 ft.
M-1	J. S. Spinks.....	W. L. Boone Drilling Co.	1964	21	2	Qt	85	12	1964	J	D	Casing: 2-in from surface to 17 ft; 2-in screen from 17 to 21 ft.
M-2	W. G. Hearn.....	.....	1956	65	4	Tmu	155	41	1956	J	D,S	Casing: 4-in from surface to 20 ft; none below.
M-3	.....do.....	.....	...	...	...	Qt	135	...	...	F	N	Unnamed spring. Estimated flow 1000 gpm on 7-6-66.
M-4	Leroy High School.	Holland Drilling Co.	1946	360	4	Tmu, Tou	131	80	1946	T	PS	Casing: 4-in from surface to 100 ft; none below. Reportedly pumped at 50 gpm in 1946.
M-5	Wilson Faust.....	W. L. Boone Drilling Co.	1966	51	2	Qt, Tmu(?)	105	32	1966	J	D	Casing: 2-in from surface to 46 ft; 2-in screen from 46 to 51 ft.
M-6	L. C. Wilson.....	H. A. Presnall and Son Drilling Co.	1959	486	4	Tou, Tj, Tgl	105	60	1959	C	D	Casing: 4-in from surface to 168 ft; none below.

Table 2.--Records of wells and springs--Continued in Washington County, Alabama.

Number	Owner	Driller	Year completed	Depth of well (feet)	Diameter of well (inches)	Water-bearing unit	Altitude of land surface (feet)	Water level		Method of lift	Use of water	Remarks
								Above (+) or below land surface (feet)	Date of measurement			
M-7	Town of Leroy.....	Acme Drilling Co..	1966	167	7, 4	Tmu	100	60.4	4-17-67	T	P	Casing: 7-in from surface to 151 ft; 4-in from 130 to 151 ft; screen between 151 and 167 ft. Measured drawdown 30 ft after 8 hr pumping 115 gpm on 10-3-66. Reported average pumpage 5,000 gpd in 1966.
M-8	J. P. McKee.....	H. A. Presnall and Son Drilling Co.	1965	260	4	Tmu	125	79.5	6-29-66	S	D	Casing: 4-in from surface to 200 ft; none below.
N-1	H. B. Bracewell...	Robert Laton Drilling Co.	1953	160	4	Tmu	45	...	...	F,J	D	Casing: 4-in from surface to 150 ft; none below. Measured flow 8.6 gpm on 4-14-67.
O-1	O. D. Beech.....	O. D. Beech.....	1950	48.5	3	Tmu	180	22	1950	J	D	Casing: 3-in from surface to 43.5 ft; 3-in screen from 43.5 to 48.5 ft.
O-2	.....do.....	Robert Laton Drilling Co.	1955	89	2	Tmu	175	60	1955	J	D,S	Casing: 2-in from surface to 84 ft; 2-in screen from 84 to 89 ft.
O-3	H. E. Anderson....	H. A. Presnall and Son Drilling Co.	1956	340	4	Tmu	153	80	1956	J	D,S	Casing: 4-in from surface to 220 ft; none below.
O-4	J. R. Dickey, Jr..	Robert Laton Drilling Co.	1963	90	2	Tmu	130	...	...	J	D	Casing: 2-in from surface to 85 ft; 2-in screen from 85 to 90 ft.
P-1	Curtis Loper.....	.....do.....	1965	180	2	Tmu	180	57	1965	J	D	Casing: 2-in from surface to 175 ft; 2-in screen from 175 to 180 ft.

Table 2.--Records of wells and springs--Continued in Washington County, Alabama.

Number	Owner	Driller	Year completed	Depth of well (feet)	Diameter of well (inches)	Water-bearing unit	Altitude of land surface (feet)	Water level		Method of lift	Use of water	Remarks
								Above (+) or below land surface (feet)	Date of measurement			
P-2	Henry Carpenter...	Robert Laton Drilling Co.	1960	212	2	Tmu	190	...	...	J	D	Casing: 2-in from surface to 207 ft; 2-in screen from 207 to 212 ft.
P-3	Town of Chatom....	Layne-Central Co.	1961	298	12, 6	Tmu	165	54.8	4-18-67	T	PS	Casing: 12-in from surface to 246 ft; 6-in from 178 to 248 ft; 6-in screen between 248 and 298 ft. Reported drawdown 17 ft after 8 hrs pumping 250 gpm in 1961.
P-4	.....do.....	.....do.....	1950	329	10, 8, 6	Tmu	185	71.8	4-18-67	T	PS	Casing: 10-in from surface to 21.5 ft; 8-in from surface to 237 ft; 6-in from 237 to 279 ft; 6-in screen between 279 and 329 ft Reported drawdown 63 ft after 8 hrs pumping 107 gpm in 1950.
Q-1	E. H. Stryker.....	Robert Laton Drilling Co.	1963	95	2	Tmu	255	60	1963	J	D	Casing: 2-in from surface to 90 ft; 2-in screen from 90 to 95 ft.
Q-2	.....do.....	National Butane Co.	1955	365	2	Tmu	260	...	...	C	D	
Q-3	R. L. Hennis.....	Peoples Drilling Co.	1960	236	2	Tmu	225	86	1960	J	D,S	Casing: 2-in from surface to 232 ft; 2-in screen from 232 to 236 ft.
S-1	R. McCann.....	Robert Laton Drilling Co.	1966	93	2	Tmu	236	53	1966	J	D	Casing: 2-in from surface to 88 ft; 2-in screen from 88 to 93 ft.
S-2	A. E. Deese.....	W. E. Haertel Drilling Co.	1966	236	2	Tmu	232	58	1966	J	D,S	Casing: 2-in from surface to 230 ft; 2-in screen from 230 to 236 ft.

Table 2.--Records of wells and springs in Washington County, Alabama.--Continued

Number	Owner	Driller	Year completed	Depth of well (feet)	Diameter of well (inches)	Water-bearing unit	Altitude of land surface (feet)	Water level		Method of lift	Use of water	Remarks
								Above (+) or below land surface (feet)	Date of measurement			
T-1	Edgar Williams....	W. E. Haertel Drilling Co.	1965	40	2	Tmu	265	24	1965	J	D	Casing: 2-in from surface to 36 ft; 2-in screen from 36 to 40 ft.
T-2	Billy Moseley.....	.....do.....	1965	142	2	Tmu	251	54	1965	J	D	Casing: 2-in from surface to 138 ft; 2-in screen from 138 to 142 ft.
T-3	Herman Williams...	.....do.....	1965	90	2	Tmu	237	10	1965	J	D,S	Casing: 2-in from surface to 86 ft; 2-in screen from 86 to 90 ft.
T-4	Mrs. Grace Williams.	.....do.....	1965	84	2	Tmu	246	41	1965	J	D	Casing: 2-in from surface to 80 ft; 2-in screen from 80 to 84 ft.
T-5	Randolph Spots....	.....do.....	1963	50	2	Tmu	247	36	1963	C	D	Casing: 2-in from surface to 46 ft; 2-in screen from 46 to 50 ft.
U-1	Bruce Williams....	.....do.....	1965	32	2	Tmu	325	20	1965	J	D	Casing: 2-in from surface to 26 ft; 2-in screen from 26 to 32 ft.
U-2	A. C. Baxter.....	Robert Laton Drilling Co.	1952	58	2	Tmu	140	...	...	J	D	Casing: 2-in from surface to 53 ft; 2-in screen from 53 to 58 ft.
U-3	W. W. Kirkland....	Leftwich Drilling Co.	1948	440	4	Tmu	230	100	1948	J	D	Casing: 4-in from surface to 400 ft; none below.
V-1	Donald Delmarter..	W. E. Haertel Drilling Co.	1962	146	2	Tmu	210	78	1962	J	D	Casing: 2-in from surface to 141 ft; 2-in screen from 141 to 146 feet.
V-2	Leon Parnell.....	Robert Laton Drilling Co.	1960	136	2	Tmu	204	...	...	J	D	Casing: 2-in from surface to 132 ft; 2-in screen from 132 to 136 ft.

Table 2.--Records of wells and springs--Continued in Washington County, Alabama.

Number	Owner	Driller	Year completed	Depth of well (feet)	Diameter of well (inches)	Water-bearing unit	Altitude of land surface (feet)	Water level		Method of lift	Use of water	Remarks
								Above (+) or below land surface (feet)	Date of measurement			
W-1	J. O. Sullivan....	H. A. Presnall and Son Drilling Co.	1960	120	2	Tmu	65	38	1960	J	S	Casing: 2-in from surface to 115 ft; 2-in screen from 115 to 120 ft.
AA-1	Geigy Chemical Co.	Layne-Central Co.	1960	97	24, 16	Qal	47	...	...	T	I	Casing: 24-in from surface to 50 ft; 16-i from surface to 69 ft; 16-in from 89 to ft; 16-in screen between 69 and 89 ft. Reported drawdown 12 ft after 2 hrs pumping 503 gpm in 1961.
AA-2	.....do.....	.....do.....	1952	324	24, 12	Tmu	48	1/ 130.3	4-18-67	T	I	Casing: 24-in from surface to 236 ft; 12- from 176 to 324 ft; 12-in screen between 239 and 314 ft. Reported drawdown 37 ft after 1½ hours pumping 995 gpm in 1965.
AA-3	Olin Chemical Co..	A. W. Williams....	1951	255	12	Tmu	39	75.0	4-18-67	T	I	Casing: 12-in from surface to 215 ft; 12- screen between 215 and 255 ft. Reported pumped at 525 gpm in 1967.
AA-4	.....do.....	.....do.....	1951	290	12	Tmu	49	1/ 150.0	4-18-67	T	I	Casing: 12-in from surface to 210 ft; 12- screen between 210 and 290 ft. Reported drawdown 12.4 ft after 8 hours pumping 2 gpm in 1951. Reportedly pumped at 550 g in 1967.

Table 2.--Records of wells and springs--Continued in Washington County, Alabama.

Number	Owner	Driller	Year completed	Depth of well (feet)	Diameter of well (inches)	Water-bearing unit	Altitude of land surface (feet)	Water level		Method of lift	Use of water	Remarks
								Above (+) or below land surface (feet)	Date of measurement			
AA-5	Geigy Chemical Co.	Layne-Central Co..	1960	81	36, 24, 16	Qal	48	...	...	T	I	Casing: 36-in from surface to 10 ft; 24-in from surface to 41 ft; 16-in from 41 to 5? ft; 16-in from 72 to 81 ft; 16-in screen between 52 and 72 ft. Reported drawdown 9 ft after 3 hours pumping 503 gpm in 196?
AA-6	.....do.....	.....do.....	1957	320	24, 12	Tmu	47	1/ 132.0	4-18-67	T	I	Casing: 24-in from surface to 221 ft; 12-i? from 161 to 226 ft; 16-in from 310 to 320 ft; 12-in screen? between 226 and 310 ft. Reported drawdown 19.5 ft after 8 hours pumping 1,000 gpm in 1957.
AA-7	do Geigy Chemical Co.	.....do.....	1952	341	24, 12	Tmu	48	1/ 119.8	4-18-67	T	I	Casing: 24-in from surface to 242 ft; 12-i? casing and screen? between 242 and 341 ft Reported drawdown 14 ft after 1 hour pumping 1,000 gpm in 1965.
AA-8	Olin Chemical Co.	A. W. Williams....	1951	245	12	Tmu	47	1/ 140.0	4-18-67	T	I	Casing: 12-in from surface to 202 ft; 12-i? screen between 202 and 245 ft. Reported drawdown 35 ft after 8 hours pumping 235 gpm in 1951. Reportedly pumped at 600 gp? in 1967.

Table 2.--Records of wells and springs in Washington County, Alabama--Continued

Number	Owner	Driller	Year completed	Depth of well (feet)	Diameter of well (inches)	Water-bearing unit	Altitude of land surface (feet)	Water level: Above (+) or below land surface (feet)	Water level: Date of measurement	Method of lift	Use of water	Remarks
AA-9	Olin Chemical Co..	Olin Chemical Co..	1957	314	20, 9, 6	Tmu	47	1/130.0	4-18-67	T	I	Casing: 20-in from surface to 200 ft; 9-in from 173 to 200 ft; 6-in from 240 to 274 f 9-in screen from 200 to 240 ft; 6-in from 274 to 314 ft. Reportedly pumped at 550 gpm in 1967.
AA-10	.....do.....	A. W. Williams....	1951	240	12	Tmu	47	1/108.0	4-18-67	T	I	Casing: 12-in from surface to 200 ft; 12-in screen between 200 and 240 ft. Reported drawdown 10.6 ft after 8 hours pumping 238 gpm in 1951. Reportedly pumped at 725 gpm in 1967.
AA-11	.....do.....	Olin Chemical Co.	1957	303	24, 16, 12	Tmu	37	1/160.0	4-18-67	T	I	Casing: 24-in from surface to 73 ft; 16-in from surface to 243 ft; 12-in from 221 to 251 ft; 12-in from 292 to 303 ft; 12-in screen between 251 and 292 ft. Reportedly pumped at 1,150 gpm in 1967.
BB-1	Mr. Shepard.....	Holland Drilling Co.	1949	170	4	Tmu	48	...	...	T	D	Casing: 4-in from surface to 162 ft; 4-in screen from 162 to 170 ft.
CC-1	T. M. Shepard.....	Robert Laton Drilling Co.	1958	268	2	Tmu	130	3	1958	J	D	Casing: 2-in from surface to 263 ft; 2-in screen from 263 to 268 ft.

Table 2.--Records of wells and springs in Washington County, Alabama--Continued

Number	Owner	Driller	Year completed	Depth of well (feet)	Diameter of well (inches)	Water-bearing unit	Altitude of land surface (feet)	Water level		Method of lift	Use of water	Remarks
								Above (+) or below land surface (feet)	Date of measurement			
CC-2	J. L. Daugherty....	Robert Laton Drilling Co.	1964	95	2	Tmu	140	...	...	J	S	Casing: 2-in from surface to 90 ft; 2-in screen from 90 to 95 ft.
CC-3	T. H. Taylor.....	Holland Drilling Co.	1953	258	4	Tmu	100	...	...	F,J	D	Casing: 4-in from surface to 240 ft; none below. Measured flow 0.9 gpm on 4-15-66.
DD-1	Jack Pry.....	W. E. Haertel Drilling Co.	1966	280	2	Tmu	230	101	1966	J	D	Casing: 2-in from surface to 276 ft; 2-in screen from 276 to 280 ft.
DD-2	Raymond Davidson...	.....do.....	1963	40	2	Tmu	213	21	1963	J	D	Casing: 2-in from surface to 36 ft; 2-in screen from 36 to 40 ft.
DD-3	Gary Patrick.....	.....do.....	1964	177	2	Tmu	210	49	1964	J	D	Casing: 2-in from surface to 173 ft; 2-in screen from 173 to 177 ft.
DD-4	Robert Ladrun.....	Robert Laton Drilling Co.	1960	305	4	Tmu	230	20	1960	C	D	Casing: 4-in from surface to 300 ft; 4-in screen from 300 to 305 ft.
DD-5	Jethro Weaver.....	W. E. Haertel Drilling Co.	1966	43	2	Tmu	195	24	1966	J	D	Casing: 2-in from surface to 37 ft; 2-in screen from 37 to 43 ft.
EE-1	Town of Fruitdale..	Acme Drilling Co..	1966	273	6, 4	Tmu	245	88	1966	S	PS	Casing: 6-in from surface to 250 ft; 4-in from surface to 258 ft; 4-in screen betwe 258 and 273 ft. Reported drawdown 72 ft after 8 h pumping 50 gpm in 1966. Reported average pumpage 10,000 gpd in 1966.

Table 2.--Records of wells and springs in Washington County, Alabama--Continued

Number	Owner	Driller	Year completed	Depth of well (feet)	Diameter of well (inches)	Water-bearing unit	Altitude of land surface (feet)	Water level		Method of lift	Use of water	Remarks
								Above (+) or below land surface (feet)	Date of measurement			
EE-2	A. W. Coaker.....	Herbert Risen Drilling Co.	1957	75	2	Tmu	190	16	1957	J	D	Casing: 2-in from surface to 70 ft; 2-in screen from 70 to 75 ft.
EE-3	Mary Still.....	W. E. Haertel Drilling Co.	1965	40	2	Tmu	203	20	1965	J	D,S	Casing: 2-in from surface to 36 ft; 2-in screen from 36 to 40 ft.
EE-4	Robert Coaker.....	.....do.....	1966	95	2	Tmu	265	48	1966	J	D,S	Casing: 2-in from surface to 90 ft; 2-in screen from 90 to 95 ft.
HH-1	Herman Grimes.....	.....do.....	1965	45	2	Tmu	180	25	1965	J	D	Casing: 2-in from surface to 41 ft; 2-in screen from 41 to 45 ft.
HH-2	Grover Mizell.....	.....do.....	1965	43	2	Tmu	280	19	1965	J	D	Casing: 2-in from surface to 39 ft; 2-in screen from 39 to 43 ft.
HH-3	E. M. Tedder.....	.....do.....	1965	209	2	Tmu	255	107	1965	J	D	Casing: 2-in from surface to 205 ft; 2-in screen from 205 to 209 ft.
HH-4	.....do.....	.....do.....	1965	236	2	Tmu	250	97	1965	J	D	Casing: 2-in from surface to 232 ft; 2-in screen from 232 to 236 ft.
HH-5	Aubrey Jones.....	.....do.....	1965	49	2	Tmu	265	28	1965	J	D	Casing: 2-in from surface to 41 ft; 2-in screen from 41 to 49 ft.
HH-6	Ray Beech.....	.....do.....	1964	70	2	Tmu	170	26	1964	J	D	Casing: 2-in from surface to 67 ft; 2-in screen from 67 to 70 ft.
II-1	V. P. Best.....	.....do.....	1965	301	2	Tmu	185	136	1965	J	D	Casing: 2-in from surface to 297 ft; 2-in screen from 297 to 301 ft.

Table 2.--Records of wells and springs in Washington County, Alabama--Continued

Number	Owner	Driller	Year completed	Depth of well (feet)	Diameter of well (inches)	Water-bearing unit	Altitude of land surface (feet)	Water level		Method of lift	Use of water	Remarks
								Above (+) or below land surface (feet)	Date of measurement			
II-2	Winfred Dees.....	W. E. Haertel Drilling Co.	1964	90	2	Tmu	190	47	1964	J	D	Casing: 2-in from surface to 86 ft; 2-in screen from 86 to 90 ft.
II-3	S. C. Dees.....	.....do.....	1963	246	2	Tmu	250	110	1963	J	D	Casing: 2-in from surface to 241 ft; 2-in screen from 241 to 246 ft.
II-4	Luther Turner.....	.....do.....	1965	86	2	Tmu	154	7	1965	J	D	Casing: 2-in from surface to 82 ft; 2-in screen from 82 to 86 ft.
JJ-1	H. L. Jarman.....	H. L. Jarman.....	1956	60	2	Tmu	95	10	1956	J	D	Casing: 2-in from surface to 55 ft; 2-in screen from 55 to 60 ft.
KK-1	Donald Dickerson..	H. A. Presnall and Son Drilling Co.	1965	65	2	Qal	50	30	1965	J	D	Casing: 2-in from surface to 60 ft; 2-in screen from 60 to 65 ft.
KK-2	Hill Spring School	Robert Laton Drilling Co.	1956	156	2	Tmu	280	48	1956	J	D	Casing: 2-in from surface to 151 ft; 2-in screen from 151 to 156 ft.
QQ-1	J. B. Turner.....	W. E. Haertel Drilling Co.	1965	200	2	Tmu	205	21	1965	J	D	Casing: 2-in from surface to 197 ft; 2-in screen from 197 to 200 ft.

1/ Water level during pumping; wells pumped continuously.

Table 3.--Chemical analyses of water from wells and springs in Washington County, Alabama.

Water-bearing unit: Th, Hatchetigbee Formation; Tt, Tallahatta Formation; Tgl, Gosport Sand and Lisbon Formation undifferentiated; Tj, Jackson Group; Tou, Oligocene Series undifferentiated; Tmu, Miocene Series undifferentiated; Qt, high terrace deposits; Qal, alluvium and low terrace deposits.

~~Results in milligrams per liter except as indicated~~ (Well numbers correspond with those shown on figure 2 and table 2.)

fbn

Milligrams per liter

Number	~~Owner~~ or well owner	Date of collection	Water-bearing unit	~~Discharge (mgd)~~ or well depth (feet)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Specific conductance (micromhos at 25° C)	pH	Temperature: °C	Temperature: °F
A-1	C. Braun.....	6- 6-66	Th	~~11(?)~~	...	0.31	...	...	...	...	1,310	128	...	780	...	...	...	50	0	4,410	8.9	19	67
A-2	R. L. Butts.....	6- 8-66	Tgl	20	...	.22	...	...	...	...	34	0	...	13	...	...	...	38	10	131	6.3	19	66
B-1	S. A. Hoorer.....	6- 7-66	Tt	95	...	.05	...	...	...	...	270	24	...	12	...	...	...	15	0	543	8.8	20	68
B-2	Joe Dumas.....	6- 6-66	Th(?)	~~4(?)~~	...	.23	...	...	...	...	982	34	...	4,400	...	...	...	150	0	13,500	8.4	19	67
B-3	Earl Johnston.....	6- 8-66	Tgl	90	...	.30	...	...	...	...	76	0	...	26	...	...	...	55	0	264	8.0	21	69
B-4	.....do.....	6- 7-66	Tgl, Th(?)	270	...	.54	...	...	...	...	682	6	...	480	...	...	...	20	0	2,400	8.3	21	70
B-5	.....do.....	6- 7-66	Tgl, Th(?)	290	...	.88	...	...	...	...	206	84	...	45	...	...	...	18	0	715	9.6	21	70
B-6	Oscar Braun.....	7-22-66	Tgl	276	...	.13	...	...	...	...	284	0	...	3.4	...	...	...	128	0	441	7.8	22	71
B-7	T. R. Grimes.....	7-22-66	Tmu	65	...	2.7	...	...	...	...	28	0	...	2.6	...	...	...	32	9	77	7.2	20	68
C-1	H. J. Lassiter....	7-19-66	Tgl	~~113~~ 500	...	1.0	...	...	...	...	446	0	...	9.8	...	...	...	320	0	719	7.5	21	69
C-2	.....do.....	7-19-66	Tj, Tgl	220	...	.29	...	...	...	...	408	0	...	7.6	...	...	...	185	0	673	8.0	21	69
C-3	Harold Blount.....	7-19-66	Tmu	57	...	.04	...	...	...	...	14	0	...	5.0	...	...	...	12	1	50	7.3	21	69
C-4	A. I. Brown.....	7-19-66	Tou	150	...	.45	...	...	...	...	214	0	...	2.2	...	...	...	165	0	332	8.0	21	69
C-5	Town of Millry....	3-31-66	Tou	248	...	.06	...	...	...	...	134	10	...	2.2	...	...	...	95	0	260	8.6	21	69
C-5	.....do.....	10-10-66	Tou	248	14	.09	24	4.1	29	2.9	158	0	14	2.8	0.1	0.0	169	77	0	273	...	..	..
D-1	Emory Becton.....	7-25-66	Tmu	82	...	.12	...	...	...	...	28	0	...	2.8	...	...	...	25	2	63	7.1	20	68

Table 3.--Chemical analyses of water from wells and springs in Washington

Number	~~Stream name or~~ well owner	Date of collection	Water-bearing unit	~~Stream discharge (mgd) at~~ well depth (feet)	Milligrams per liter: Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Specific conductance (micromhos at 25° C)	pH	°C	°F
D-2	Rodick Dearmon.....	7-12-66	~~Qal (?)~~ Tmu	35	...	0.24	...	...	...	...	8	0	...	3.2	...	...	...	12	5	42	5.6	19	67
D-3	Mrs. W. S. Knight..	7-12-66	Tmu	Spring	...	.07	...	...	...	...	28	0	...	2.4	...	...	...	28	5	82	6.2	19	67
D-4	R. H. Tucker.....	7-12-66	Tmu	80	...	.26	...	...	...	...	4	0	...	3.6	...	...	...	10	7	39	5.7	21	69
D-5	V. V. Kirkland.....	7-26-66	Tmu	47	...	.56	...	...	...	...	12	0	...	2.6	...	...	...	8	0	35	6.4	19	67
D-6	E. T. Causey.....	7-12-66	Tmu	55	...	.73	...	...	...	...	2	0	...	4.8	...	...	...	10	8	34	5.5	19	67
E-1	J. H. Odom.....	7-12-66	Tou, Tj, Tgl	466	...	.22	...	...	...	...	116	0	...	1.8	...	...	...	105	10	206	8.1	21	70
E-2	.....do.....	7-12-66	Tmu	110	...	.30	...	...	...	...	4	0	...	3.8	...	...	...	5	2	28	5.6	21	69
E-3	.....do.....	7-12-66	Tmu	116	...	5.9	...	...	...	...	8	0	...	2.6	...	...	...	8	1	30	6.2	20	68
G-1	Mrs. Agusta Sullivan.	7-28-66	Tmu	215	...	11	...	...	...	...	30	0	...	2.2	...	...	...	25	0	52	7.5	21	70
G-2	J. J. Carter.....	7-25-66	Tmu	69	...	1.2	...	...	...	...	8	0	...	5.8	...	...	...	12	5	43	5.7	20	68
G-3	Mrs. Hattie Sanders	7-26-66	Tmu	195	...	1.2	...	...	...	...	52	0	...	3.8	...	...	...	35	0	109	6.8	21	70
G-4	Ernest Odom.....	7-25-66	Tmu, Tou(?)	320	...	.18	...	...	...	...	190	0	...	1.8	...	...	...	145	0	305	8.0	22	71
H-1	M. L. Dixon.....	7-20-66	Tmu	270	...	2.9	...	...	...	...	44	0	...	3.2	...	...	...	42	6	100	7.5	21	69
H-2	L. H. Thompson.....	7-26-66	Tmu	75	...	.50	...	...	...	...	22	0	...	8.0	...	...	...	20	2	72	6.8	20	68
J-1	Earl Johnson.....	6- 7-66	Th(?)	2,000	...	1.9	...	...	...	...	570	0	...	12,800	...	...	...	1,100	633	32,600	7.7	26	78

in Washington County, Alabama,

Table 3.--Chemical analyses of water from wells and springs--Continued.

Number	~~Stream name~~ or well owner	Date of collection	Water-bearing unit	~~Stream discharge (mgd)~~ or well depth (feet)	Milligrams per liter													Hardness as $CaCO_3$		Specific conductance (micromhos at 25° C)	pH	Temperature	
					Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Calcium, magnesium	Non-carbonate			°C	°F
J-2	Lone Star Cement Co.	7-21-66	Tj	60	...	0.14	...	...	...	...	316	0	...	9.6	...	...	...	225	0	739	8.0	20	68
J-3	Douglas Palmer....	7-20-66	Tou, Tj, Tgl (?)	340	...	.43	...	...	...	...	198	0	...	3.6	...	...	...	170	8	322	7.6	21	69
J-4	H. M. Wilson.....	7-21-66	Tou, Tj, Tgl (?)	350	...	.33	...	...	...	...	194	0	...	2.8	...	...	...	165	6	315	7.9	22	71
J-5	C. J. Alston.....	7-20-66	Tmu	60	...	.07	...	...	...	...	6	0	...	2.6	...	...	...	5	0	20	6.6	21	69
J-6	Coleman Moseley...	7-20-66	Tmu	55	...	.59	...	...	...	...	20	0	...	3.0	...	...	...	2	0	42	6.3	21	69
M-1	J. S. Spinks.....	6-29-66	Qt	21	...	.81	...	...	...	...	4	0	...	9.6	...	...	...	8	5	36	5.6	20	68
M-2	W. G. Hearn.....	7- 6-66	Tmu	65	...	.26	...	...	...	...	14	0	...	4.8	...	...	...	20	9	86	6.6	20	68
M-3	.....do.....	7- 6-66	Qt	Spring	...	.16	...	...	...	...	4	0	...	3.4	...	...	...	10	7	39	5.8	19	67
M-4	Leroy High School.	7- 6-66	Tmu, Tou	360	...	1.3	...	...	...	...	130	0	...	3.4	...	...	...	88	0	223	7.4	22	71
M-5	Wilson Faust.....	6-29-66	Qt, Tmu (?)	51	...	.28	...	...	...	...	6	0	...	4.2	...	...	...	8	3	24	5.5	21	69
M-7	Town of Leroy.....	9-14-66	Tmu	167	...	.29	...	...	...	...	24	0	...	4.2	...	...	...	22	2	76	7.2	20	68
M-8	J. P. McKee.....	6-29-66	Tmu	260	...	.29	...	...	...	...	14	0	...	2.0	...	...	...	2	0	38	6.8	21	70
N-1	H. B. Bracewell...	7-18-66	Tmu	160	...	2.5	...	...	...	...	8	0	...	3.0	...	...	...	12	5	42	7.1	19	67

in Washington County, Alabama.

Table 3.--Chemical analyses of water from wells and springs.--Continued.

Number	~~Stream name~~ or well owner	Date of collection	Water-bearing unit	~~Stream discharge (mgd)~~ or well depth (feet)	Milligrams per liter													Hardness as $CaCO_3$		Specific conductance (micromhos at 25° C)	pH	Temperature	
					Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Calcium, magnesium	Non-carbonate			°C	°F
O-1	O. D. Beech.....	8-10-66	Tmu	48.5	...	0.26	...	...	...	...	2	0	...	18	...	...	...	.45	43	160	5.0	20	68
O-2	.....do.....	8-10-66	Tmu	89	...	1.3	...	...	...	...	10	0	...	3.4	...	...	...	12	4	35	7.1	20	68
O-3	H. E. Anderson....	8- 9-66	Tmu	340	...	.45	...	...	...	...	176	0	...	3.0	...	...	...	95	0	282	8.0	21	70
O-4	J. R. Dickey, Jr..	8- 3-66	Tmu	90	...	3.0	...	...	...	...	8	0	...	2.8	...	...	...	5	0	19	7.2	20	68
P-1	Curtis Loper.....	8- 2-66	Tmu	180	...	2.1	...	...	...	...	40	0	...	2.6	...	...	...	22	0	96	6.8	21	70
P-2	Henry Carpenter...	8- 3-66	Tmu	212	...	6.9	...	...	...	...	26	0	...	2.2	...	...	...	22	1	55	7.2	21	70
P-3	Town of Chatom....	4-27-66	Tmu	298	...	.14	...	...	...	...	172	0	...	4.6	...	...	...	88	0	274	8.0	21	69
P-3	.....do.....	10-11-66	Tmu	298	21	.30	20	7.1	32	4.0	178	0	4.8	3.4	0.1	0.0	180	79	0	288	7.3	..	..
P-4	.....do.....	4-27-66	Tmu	329	...	.26	...	...	...	...	176	0	...	4.4	...	...	...	85	0	279	8.0	21	69
P-4	.....do.....	10-11-66	Tmu	329	20	.04	21	7.2	34	3.2	176	0	4.6	4.0	.0	.0	181	82	0	278	...	..	..
Q-1	E. H. Stryker.....	8- 4-66	Tmu	95	...	2.5	...	...	...	...	12	0	...	3.0	...	...	...	25	15	44	7.2	20	68
Q-2	.....do.....	8- 4-66	Tmu	365	...	.72	...	...	...	...	132	0	...	3.4	...	...	...	95	0	216	8.0	21	70
Q-3	R. L. Hennis.....	8- 7-66	Tmu	236	...	2.2	...	...	...	...	8	0	...	2.8	...	...	...	12	5	31	6.9	21	70
S-1	R. McCann.....	8- 8-66	Tmu	93	...	.85	...	...	...	...	20	0	...	9.0	...	...	...	18	2	60	6.9	20	68
S-2	A. E. Deese.....	8- 2-66	Tmu	236	...	3.2	...	...	...	...	18	0	...	3.6	...	...	...	18	3	46	7.0	21	70
T-1	Edgar Williams....	4-26-66	Tmu	40	...	3.1	...	...	...	...	22	0	...	8.8	...	...	...	50	32	114	5.9	19	66
T-2	Billy Moseley.....	4-28-66	Tmu	142	...	6.8	...	...	...	...	60	0	...	4.0	...	...	...	32	0	103	6.5	20	68

in Washington County, Alabama.

Table 3.--Chemical analyses of water from wells and springs--Continued.

Milligrams per liter

Number	~~Stream name or~~ well owner	Date of collection	Water-bearing unit	~~Stream discharge (mgd) or~~ well depth (feet)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Specific conductance (micromhos at 25° C)	pH	Temperature: °C	Temperature: °F
T-3	Herman Williams...	4-22-66	Tmu	90	...	3.9	...	...	...	...	42	0	...	3.8	...	...	...	30	0	78	6.4	20	68
T-4	Mrs. Grace Williams	4-25-66	Tmu	84	...	.18	...	...	...	...	8	0	...	6.4	...	...	...	32	25	96	6.1	19	67
T-5	Randolph Spots....	4-22-66	Tmu	50	...	.62	...	...	...	...	40	0	...	4.2	...	...	...	10	0	68	6.7	19	67
U-1	Bruce Williams....	4-28-66	Tmu	32	...	.17	...	...	...	...	8	0	...	13	...	...	...	50	43	145	5.6	19	66
U-2	A. C. Baxter.....	8- 5-66	Tmu	58	...	3.7	...	...	...	...	28	0	...	3.8	...	...	...	20	0	65	6.5	19	67
U-3	W. W. Kirkland....	8-11-66	Tmu	440	...	.64	...	...	...	...	154	0	...	5.0	...	...	...	92	0	252	8.2	21	69
V-1	Donald Delmarter..	5-23-66	Tmu	146	...	.48	...	...	...	...	76	0	...	4.4	...	...	...	35	0	132	7.2	20	68
V-2	Leon Parnell.....	8-10-66	Tmu	136	...	.49	...	...	...	...	78	0	...	4.4	...	...	...	40	0	142	7.3	20	68
W-1	J. O. Sullivan....	7-21-66	Tmu	120	...	.84	...	....	...	...	24	0	...	4.0	...	...	...	8	0	60	6.6	21	69
AA-2	Geigy Chemical Co.	7-11-66	Tmu	324	...	.21	...	...	...	...	8	0	...	5.0	...	...	...	10	3	34	5.4	21	70
AA-3	Olin Chemical Co..	6-30-66	Tmu	255	...	.26	...	...	...	...	42	0	...	26	...	...	...	2	0	174	6.7	21	70
AA-4	.....do.....	6-30-66	Tmu	290	...	.49	...	...	...	...	52	0	...	94	...	...	...	55	12	545	6.4	21	70
AA-4	.....do.....	10-10-66	Tmu	290	12	.51	16	2.3	87	1.8	45	0	70	95	0.1	0.0	306	49	12	545	6.4	..	..
AA-5	Geigy Chemical Co.	7-11-66	Qal	81	...	.33	...	...	...	...	6	0	...	7.4	...	...	...	12	7	50	5.5	21	70
AA-6	.....do.....	7-11-66	Tmu	320	...	.65	...	...	...	...	80	0	...	99	...	...	...	12	0	428	7.1	21	70
AA-11	Olin Chemical Co.	6-30-66	Tmu	303	...	.14	...	...	...	...	158	0	...	93	...	...	...	8	0	532	7.6	21	69
BB-1	--Shepard.....	6-30-66	Tmu	170	...	14	...	...	...	...	6	0	...	5.4	...	...	...	10	5	32	5.6	21	70

in Washington County, Alabama.

Table 3.--Chemical analyses of water from wells and springs--Continued.

Number	~~Stream name or~~ well owner	Date of collection	Water-bearing unit	~~Stream discharge (mgd) or~~ well depth (feet)	Milligrams per liter													Hardness as $CaCO_3$		Specific conductance (micromhos at 25° C)	pH	Temperature	
					Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Calcium, magnesium	Non-carbonate			°C	°F
CC-1	T. M. Shepard.....	8- 1-66	Tmu	268	...	0.07	...	...	...	...	140	0	...	7.2	...	...	...	10	0	233	8.2	22	71
CC-2	J. L. Daugherty....	8-12-66	Tmu	95	...	1.5	....	...	...	...	28	0	...	2.6	...	...	...	18	0	58	6.8	20	68
CC-3	T. H. Taylor.....	8-10-66	Tmu	258	...	.11	...	...	...	...	146	0	...	9.8	...	...	...	5	0	244	7.9	21	69
DD-1	Jack Pry.....	5-12-66	Tmu	280	...	.70	...	...	...	...	78	0	...	3.4	...	...	...	42	0	133	7.1	20	68
DD-2	Raymond Davidson...	5- 4-66	Tmu	40	...	.20	...	...	...	...	10	0	...	3.0	...	...	...	8	0	26	7.5	21	70
DD-3	Gary Patrick.....	5- 2-66	Tmu	177	...	.74	...	...	...	...	74	0	...	3.2	...	...	...	42	0	127	7.5	20	68
DD-4	Robert Landrun.....	5- 4-66	Tmu	~~397~~ 305	...	.46	...	...	...	...	88	0	...	6.4	...	...	...	20	0	155	7.5	21	70
DD-5	Jethro Weaver.....	5- 4-66	Tmu	43	...	.75	...	...	....	...	16	0	...	15	...	...	...	25	12	121	5.7	19	67
EE-1	Town of Fruitdale..	8- 5-66	Tmu	273	...	1.9	...	...	...	...	70	0	...	3.8	...	...	...	50	0	123	7.6	21	69
EE-1	.....do.....	10-11-66	Tmu	273	18	2.0	9.0	4.7	7.2	4.3	67	0	3.0	4.0	0.0	0.0	83	42	0	124	6.8	..	..
EE-2	A. W. Coaker.....	4-26-66	Tmu	75	...	2.3	...	...	...	...	40	0	...	4.8	...	...	...	38	5	85	6.2	20	68
EE-3	Mary Still.....	4-21-66	Tmu	40	...	6.7	...	...	...	...	10	0	...	4.0	...	...	...	8	0	28	5.6	19	66
EE-4	Robert Coaker.....	4-21-66	Tmu	95	...	.14	...	...	...	...	4	0	...	3.2	...	...	...	12	9	26	5.5	20	68
HH-1	Herman Grimes.....	4-28-66	Tmu	45	...	.42	...	...	...	...	22	0	...	3.2	...	...	...	8	0	39	6.0	19	67
HH-2	Grover Mizell.....	4-21-66	Tmu	43	...	.16	...	...	...	...	4	0	...	6.8	...	...	...	8	5	37	5.7	19	67
HH-3	E. M. Tedder.....	4-29-66	Tmu	209	...	1.4	...	...	...	...	80	0	...	4.0	...	...	...	25	0	145	7.0	21	69

in Washington County, Alabama.

Table 3.--Chemical analyses of water from wells and springs--Continued.

Number	~~Stream name or~~ well owner	Date of collection	Water-bearing unit	~~Stream discharge (mgd) or~~ well depth (feet)	Milligrams per Liter													Hardness as $CaCO_3$		Specific conductance (micromhos at 25° C)	pH	Temperature	
					Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Calcium, magnesium	Non-carbonate			°C	°F
MM-4	E. M. Tedder.....	4-29-66	Tmu	236	...	0.15	...	...	...	...	94	0	...	5.6	...	...	...	15	0	154	7.8	21	69
MM-5	Aubrey Jones.....	8-10-66	Tmu	49	...	.86	...	...	...	...	104	0	...	6.2	...	...	...	12	0	168	7.8	19	67
MM-6	Ray Beech.....	8-11-66	Tmu	70	...	.30	...	...	...	...	104	0	...	4.2	...	...	...	28	0	163	8.0	20	68
II-1	V. P. Best.....	8-12-66	Tmu	301	...	.21	...	...	...	...	102	0	...	3.2	...	...	...	20	0	163	7.9	21	70
II-2	Winfred Dees.....	5- 3-66	Tmu	90	...	.54	...	...	...	...	110	0	...	53	...	...	...	72	0	380	6.5	21	69
II-3	S. C. Dees.....	5-13-66	Tmu	246	...	.19	...	...	...	...	110	2	...	4.4	...	...	...	12	0	181	8.3	20	68
II-4	Luther Turner....	8- 9-66	Tmu	86	...	.58	...	...	...	...	92	0	...	2.2	...	...	...	32	0	145	7.6	19	67
JJ-1	H. L. Jarman.....	8-11-66	Tmu	60	...	.27	...	...	...	...	6	0	...	5.8	...	...	...	10	5	49	7.6	20	68
KK-1	Donald Dickerson.	6-30-66	Qal	65	...	25	...	...	...	...	24	0	...	4.0	...	...	...	8	0	58	6.1	20	68
KK-2	Hill Spring School.	8-12-66	Tmu	156	...	4.7	...	...	...	...	6	0	...	3.8	...	...	...	10	5	20	7.6	21	69
QQ-1	J. B. Turner.....	8- 8-66	Tmu	200	...	1.2	...	...	...	...	100	0	...	5.8	...	...	...	22	0	163	7.8	21	69

in Washington County, Alabama.

Table 4.--Chemical analyses of water from streams--Continued

Number	Stream name	Date of collection	Water-bearing unit	Stream discharge (mgd)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Specific conductance (micromhos at 25° C)	pH	Temperature: °C	Temperature: °F
					Milligrams per liter																		
2-4700.40	Tombigbee River near Jackson--Continued.	5/3-16, 18-22, 24-31/1966		....	8.8	...	13	3.0	4.6	...	41	...	14	4.3	0.2	0.1	68	45	11	116	6.6	..	..
		6/1-4/1966		....	8.1	...	8.0	5.3	5.9	...	40	...	13	5.4	.2	.3	66	42	9	114	6.5	..	..
		6/5-13, 20-28/1966		....	8.1	...	13	3.0	9.8	...	47	...	12	10	.2	.6	80	45	6	136	6.8	..	..
		6/14-19, 29-30/1966		....	12	...	15	3.1	9.7	...	50	...	12	12	.2	.1	89	50	9	150	6.8	..	..
		7/2-7/1966		....	8.4	...	15	3.5	9.1	...	50	...	11	13	.2	.5	86	52	11	152	7.1	..	..
		7/8-31/1966		....	9.3	...	16	4.4	13	...	55	...	13	19	.2	.7	103	58	13	183	7.2	..	..
		8/1-13, 15-31/1966		....	8.1	...	16	3.2	14	1.9	47	...	19	18	.2	.8	104	53	15	182	6.6	..	..
		8-14-66		....	...	...	17	3.1	...	...	50	...	...	31	...	...	...	55	14	220	8.1	..	..
		9/1-13, 16-24, 26-30/1966		....	9.2	0.00	17	4.0	15	1.3	50	...	25	18	.3	.7	116	59	18	192	6.5	..	..
		9/14-15, 25/1966		....	11	.29	22	3.1	18	2.6	47	...	30	24	.2	2.3	136	68	29	221	6.9	..	..

Table 4.--Chemical analyses of water from streams in Washington County, Alabama.

~~Results in milligrams per liter except as indicated.~~ (Where sodium is reported and no potassium is reported, sodium and potassium are calculated and reported as sodium. Station numbers correspond with those shown on figure 3.)

Number	Stream name ~~or well owner~~	Date of collection	~~Water-bearing unit~~	Stream discharge (mgd) ~~or well depth (feet)~~	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Non-carbonate	Specific conductance (micromhos at 25° C)	pH	Temperature: °C	Temperature: °F
					Milligrams per Liter																		
2-4697.75	Santa Bogue Creek near Frankville.	10- 5-66		16.7	...	...	...	...	...	...	36	0	...	11	...	...	...	25	0	97	7.3	19	66
2-4700.40	Tombigbee River near Jackson.	10-27-65		....	...	...	...	...	...	...	54	0	...	34	...	...	...	68	24	248	7.4	14	57
		12- 2-65		2,470	...	...	...	...	...	...	56	0	...	27	...	...	...	68	22	244	7.5	16	60
		1- 4-66		....	8.3	...	13	1.8	18	...	40	0	21	17	0.1	0.9	100	40	7	166	7.4	..	..
		2- 4-66		....	8.4	...	17	2.3	12	...	50	0	20	10	.1	1.1	96	52	11	157	7.4	..	..
		2-17-66		....	...	...	...	...	...	...	44	0	...	3.8	...	...	...	50	14	122	7.4	11	52
		2-28-66		....	...	...	...	...	...	...	36	0	...	6.0	...	...	...	35	5	97	7.6	11	51
		3/1-6/1966		[1]/46,000	8.0	...	12	3.4	1.9	...	36	...	12	3.9	.2	.1	60	44	14	101	6.6	..	..
		3/7-31/1966		....	8.4	...	15	2.6	4.8	...	46	...	14	4.0	.2	.0	72	48	10	127	6.6	..	..
		4/1-12/1966		....	8.9	...	15	2.3	7.4	...	44	...	14	8.4	.2	.0	78	47	11	133	6.6	..	..
		4/13-24, 26,30/1966		....	8.9	...	16	2.9	9.1	...	49	...	16	10	.2	.3	87	52	12	152	7.0	..	..
		4/25,27-29/1966		....	6.5	...	16	1.7	5.8	...	44	...	14	5.8	.2	.1	72	47	11	123	6.9	..	..
		5/2,17, 23/1966		....	8.9	...	16	2.4	6.6	...	47	...	18	4.5	.2	.3	80	50	11	132	6.9	..	..

in Washington County, Alabama.

Table 4.--Chemical analyses of water from streams--Continued

Number	Stream name ~~or well owner~~	Date of collection	Water-bearing unit	Stream discharge (mgd) ~~or well depth (feet)~~	Milligrams per liter													Hardness as $CaCO_3$		Specific conductance (micromhos at 25° C)	pH	Temperature	
					Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Calcium, magnesium	Non-carbonate			°C	°F
2-4700.40	Tombigbee River near Jackson--Continued.	10/1-10/1966		....	8.9	0.01	15	4.5	13	2.8	50	...	22	16	0.2	1.1	109	56	15	187	7.0	..	..
		10/11-23/1966		....	10	.01	17	5.7	14	2.8	56	...	27	18	.2	1.0	124	66	20	208	7.0	..	..
		10/24-31/1966		....	8.5	.04	16	3.8	13	2.8	46	...	27	15	.2	1.5	111	56	18	191	7.1	..	..
		11/1-14/1966		....	10	.08	14	4.6	13	2.6	46	...	24	15	.2	1.9	108	54	16	187	7.2	..	..
		11/15-16/1966		....	11	.28	15	3.9	15	2.6	47	...	30	15	.2	1.5	117	54	15	203	7.4	..	..
		11/17-30/1966		....	9.6	.10	14	4.1	10	2.6	40	...	24	13	.2	1.5	99	52	19	170	7.1	..	..
		12/1-12/1966		....	12	.02	16	2.9	14	2.4	47	...	24	17	.2	.9	112	52	13	188	6.8	..	..
		12/13-31/1966		....	9.7	.02	16	2.7	8.3	2.2	46	...	19	11	.2	.4	93	51	13	150	7.9	..	..
		1/1,3-8/1967		....	9.6	.07	13	2.8	7.2	1.9	39	...	18	8.5	.1	.9	81	44	12	126	7.3	..	..
		1/9,21-31/1967		....	9.9	.04	16	2.7	10	2.0	46	...	20	12	.2	1.0	97	51	13	161	6.8	..	..
		2/1-7/1967		....	11	.03	15	2.1	9.8	1.7	39	...	21	11	.1	1.2	92	46	14	153	7.1	..	..
		2/8-10/1967		....	11	.09	14	1.7	7.3	1.8	38	...	17	6.7	.1	1.1	80	42	11	127	6.7	..	..

in Washington County, Alabama.

Table 4.--Chemical analyses of water from streams--Continued

Number	Stream name	Date of collection	Water-bearing unit	Stream discharge (mgd)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Specific conductance (micromhos at 25° C)	pH	Temperature: °C	Temperature: °F
					Milligrams per liter																		
2-4700.40	Tombigbee River near Jackson--Continued.	2/11-28/1967		....	12	0.09	16	2.4	8.0	1.7	45	...	20	8.1	0.2	1.1	92	50	13	149	6.6	..	..
		3/1-23, 28-31/1967		....	10	.19	13	2.5	6.0	1.4	37	...	18	8.7	.2	1.5	79	43	12	125	7.2	..	..
		3/24-27/1967		....	10	.16	15	2.7	8.8	1.2	38	...	15	14	.2	1.3	87	49	17	145	7.3	..	..
		4/1-7/1967		....	12	.05	14	3.6	9.0	1.0	42	...	16	11	.2	.2	88	50	16	141	6.7	..	..
		4/8-30/1967		....	11	.03	18	2.4	14	1.4	54	...	16	16	.2	.7	107	55	11	172	7.2	..	..
		5/1-4, 28, 29/1967		....	10	.03	16	2.9	12	1.3	47	...	19	11	.3	1.0	97	52	13	162	7.1	..	..
		5/7, 20-23/1967		....	8.4	.07	12	1.8	8.2	1.2	36	...	17	7.6	.3	.1	75	37	8	117	6.7	..	..
		5/5, 6, 8-19, 24-27, 30, 31/1967		....	11	.05	14	2.7	9.1	1.3	42	...	17	8.2	.3	1.0	86	46	12	139	6.9	..	..
		6/1-6/1967		....	12	.00	19	2.6	11	1.5	53	...	19	14	.2	3.3	109	58	15	169	6.8	..	..
		6/7-30/1967		....	12	.00	18	2.7	16	1.6	52	...	22	17	.2	2.1	118	56	13	187	6.7	..	..
		7/1-9/1967		....	18	.01	17	3.1	15	1.8	51	...	22	18	.3	1.9	122	55	13	196	7.1	..	..

in Washington County, Alabama.

Table 4.--Chemical analyses of water from streams--Continued

Number	Stream name ~~(well owner)~~	Date of collection	Water-bearing unit	Stream discharge (mgd) ~~or well depth (feet)~~	Milligrams per liter: Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Hardness as $CaCO_3$: Calcium, megnesium	Hardness as $CaCO_3$: Noncarbonate	Specific conductance (micromhos at 25° C)	pH	Temperature: °C	°F
2-4700.40	Tombigbee River near Jackson--Continued.	7/10-31/1967		....	12	0.04	20	1.7	8.3	1.6	61	...	13	9.8	0.2	1.6	98	57	7	155	7.2	..	..
		8/1-4,6-11/1967		....	12	.01	20	1.0	10	2.2	57	...	13	12	.2	.7	99	54	7	186	6.8	..	..
		8-15-67		....	...	...	...	...	...	...	58	...	...	29	...	...	...	68	20	250	7.8	..	..
		8/12-27, 30-31/1967		....	11	.01	17	2.3	9.3	2.2	51	...	16	9.0	.2	.7	93	52	10	161	6.5	..	..
		8/28-29/1967		....	...	...	...	...	...	...	40	...	...	6.8	...	...	...	49	16	137	7.3	..	..
		9/1-15/1967		....	9.5	.00	16	3.2	9.1	2.2	44	...	22	9.2	.2	1.3	95	53	17	161	6.6	..	..
		9/16-30/1967		....	9.9	.01	16	3.2	12	2.2	42	...	28	13	.1	1.5	107	53	19	178	6.7	..	..
2-4702.00	West Bassett Creek near Chatom.	10-5-66		1.0	...	...	...	...	...	...	4	0	...	3.4	...	...	...	5	2	20	6.0	17	63
2-4702.05	West Bassett Creek at Bassetts Creek.	10-5-66		10.5	...	...	...	...	...	...	4	0	...	2.4	...	...	...	2	0	18	6.9	18	65
2-4702.70	Lewis Creek near McIntosh.	10-6-66		1.4	...	...	...	...	...	...	6	0	...	3.8	...	...	...	2	0	21	6.8	17	63
2-4702.80	Tombigbee River near McIntosh.	10-6-66		...	...	...	...	...	...	...	48	0	...	22	...	...	...	53	16	202	6.8	22	72
2-4703.40	Bates Creek near Malcolm.	10-6-66		1.2	...	...	...	...	...	...	6	0	...	4.8	...	...	...	2	0	26	6.9	20	68

in Washington County, Alabama.

Table 4.--Chemical analyses of water from streams--Continued

Number	Stream name ~~or well owner~~	Date of collection	Water-bearing unit	Stream discharge (mgd) ~~or well depth (feet)~~	Milligrams per liter: Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Specific conductance (micromhos at 25° C)	pH	Temperature: °C	Temperature: °F
2-4703.70	Bilbo Creek near McIntosh.	10-6-66		1.7	...	...	...	...	...	...	10	0	...	7.0	...	...	...	10	2	49	7.2	18	64
2-4794.18	Escatawpa River at Escatawpa.	10-5-66		.2	...	...	...	...	...	...	4	0	...	3.0	...	...	...	5	2	21	6.2	18	65
2-4794.25	Escatawpa River at Deer Park.	10-5-66		.5	...	...	...	...	...	...	4	0	...	4.6	...	...	...	8	5	30	5.7	19	67

1/ Mean.