GEOLOGY AND GROUND-WATER RESOURCES OF FRANKLIN COUNTY, ALABAMA

A Reconnaissance

By Richard R. Peace, Jr.

GEOLOGICAL SURVEY OF ALABAMA *BULLETIN 72*

GEOLOGICAL SURVEY OF ALABAMA

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BULLETIN 72

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Prepared by the United States Geological Survey
in cooperation with the
Geological Survey of Alabama

UNIVERSITY, ALABAMA

1963

STATE OF ALABAMA

Honorable George C. Wallace, Governor

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University, Alabama
May 20, 1963

Honorable George C. Wallace
Governor of Alabama
Montgomery, Alabama

Dear Governor Wallace:

I have the honor to transmit the manuscript of a report entitled "Geology and Ground-Water Resources of Franklin County, Alabama, a Reconnaissance," by Richard R. Peace, Jr., with the request that it be printed as Bulletin 72 of the Geological Survey of Alabama.

Geologic formations cropping out in Franklin County range in age from Mississippian consolidated rocks to Late Cretaceous unconsolidated gravel. The regional dip of the rocks is toward the south about 57 feet per mile. The chief sources of ground water are the Pottsville Formation and the Tuscaloosa Group. Wells have been pumped at 60 gallons per minute for municipal and industrial use from the Tuscaloosa at Red Bay, Ala., and from the Pottsville at Phil Campbell, Ala. Most of the ground water in the county is of good quality and is low in mineral content.

Respectfully,

Philip E. LaMoreaux

Philip E. LaMoreaux
State Geologist

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GEOLOGY AND GROUND-WATER RESOURCES OF FRANKLIN COUNTY, ALABAMA

A Reconnaissance

By Richard R. Peace, Jr.

ABSTRACT

Franklin County, in northwestern Alabama, has an area of about 644 square miles. Exposed geologic formations range in age from Mississippian and Pennsylvanian consolidated rocks to Late Cretaceous unconsolidated gravel. Included are the Hartselle Sandstone, Bangor Limestone, and Pennington Formation of Mississippian age; the Pottsville Formation of Pennsylvanian age; the Tuscaloosa Group of Late Cretaceous Age; and the regolith of Quaternary age. The regional dip of the rocks in the county is toward the south at about 57 feet per mile.

The chief sources of ground water in the county are the Pottsville and the Tuscaloosa. Wells have been pumped at 60 gpm (gallons per minute) for municipal and industrial use from the Tuscaloosa at Red Bay, Ala., and from the Pottsville at Phil Campbell, Ala. The regolith supplies small amounts of water to numerous domestic and stock wells in the county. In the northeastern part of the county, many small supplies of ground water are developed from the Bangor, although many of the wells in this area yield an inadequate supply during dry seasons. In the western part of the county the supplies of water from the Bangor are generally greater. The Hartselle yields less than 2 gpm to wells. The Pennington is not an aquifer in the county.

The results of 230 field chemical analyses of ground water and 17 partial chemical analyses indicate that most of the ground water in Franklin County is of good quality and is low in mineral content.

INTRODUCTION

The demand for ground water in Alabama has increased greatly during the past few years, and, in order to meet this increased demand, information on the occurrence, availability, movement, and chemical character of ground water must be obtained. This report gives the results of a reconnaissance of the general geology and ground-water resources in Franklin County. It may be used in conjunction with a report for the Russellville area in Franklin County,

published as Information Series 28 of the Geological Survey of Alabama, "Geology and Ground-Water Resources of the Russellville Area, Alabama, an Interim Report," by R. R. Peace, Jr. This Franklin County report includes data from the Russellville area only where they are pertinent to discussions of conditions in the county.

LOCATION OF AREA

Franklin County, in northwestern Alabama, has an area of about 644 square miles. It is bounded on the north by Colbert County, on the east by Lawrence County, on the south by Winston and Marion Counties, and on the west by the State of Mississippi (fig. 1).

PURPOSE AND SCOPE OF INVESTIGATION

The purpose of the investigation was to collect data on the ground-water resources of Franklin County and to relate these data to the geology of the area. This work was begun in June 1959 by the U.S. Geological Survey in cooperation with the Geological Survey of Alabama and was done under the direct supervision of W. J. Powell, district geologist in charge of ground-water investigations in Alabama. The objectives of the investigation were:

1. Inventory most drilled and selected dug wells to determine their location, depth, construction, water level, yield, use, and aquifer tapped by each.
2. Inventory selected springs to determine their location, discharge, use, water temperature, and improvements.
3. Study the chemical quality of ground water.
4. Make geologic, physiographic, and structure maps, including geologic sections.
5. Collect data on ground-water use.
6. Make periodic measurements of water levels in selected wells to determine the seasonal fluctuations.

PREVIOUS INVESTIGATIONS

Information on ground water in Franklin County was first published by Michael Tuomey in his second report, 1858, wherein he described the waters from the Franklin Springs in the NW¼ sec. 16, T. 6 S., R. 11 W. Henry McCalley in Geological Survey of Alabama Special Report 8, "Report on the Valley Regions of Alabama

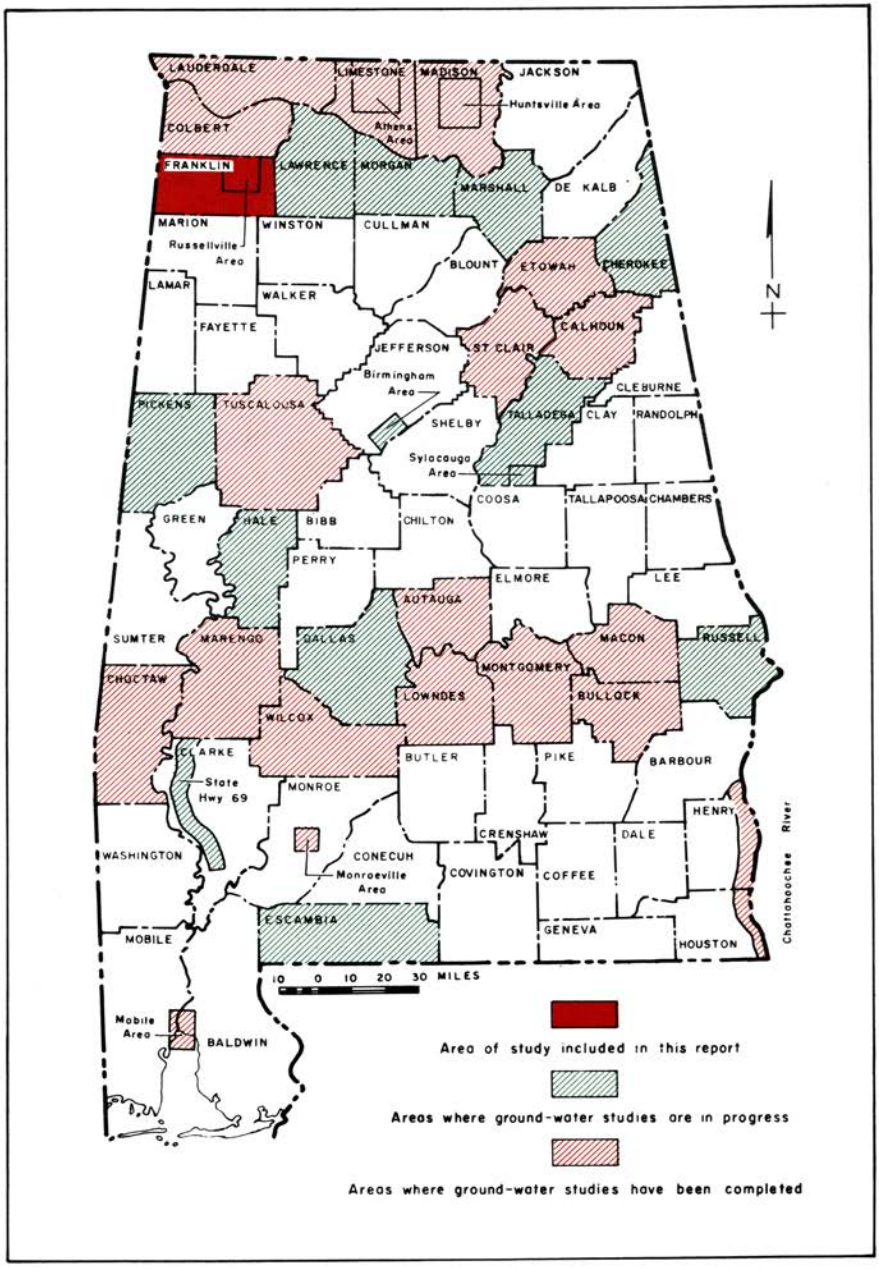


Figure 1.—Area studied and areas of other ground-water studies in Alabama.

(Paleozoic Strata), pt. 1, Tennessee Valley Region," paraphrased Tuomey and briefly described mineral springs in the eastern part of the county. He described the geology of the county in detail; however, later studies revised many of his interpretations.

William D. Johnston, Jr. (1933) made a study of ground water in northern Alabama and recorded data on 37 wells and 8 springs in Franklin County. The results of this investigation included a discussion of the geology, physiography, and ground water of Franklin County, and were published by the Geological Survey of Alabama in Special Report 16, "Ground Water in the Paleozoic Rocks of Northern Alabama."

Other reports describing the geology of Franklin County include U.S. Geological Survey Chart OC-62, 'Mississippian Rocks of the Northern Part of the Black Warrior Basin, Alabama and Mississippi," by S. W. Welch, and four reports by the Geological Survey of Alabama–Special Report 14, "Geology of Alabama," by G. I. Adams, Charles Butts, L. W. Stephenson, and C. Wythe Cooke; Special Report 15, "Oil and Gas in Alabama," by D. R. Semmes; Bulletin 50, "Well Logs of Alabama," by Edgar Bowles; and Bulletin 64, "Subsurface Stratigraphy of Northwest Alabama," by Winnie McGlamery. The soil map of Franklin County, by L. G. Brackeen and H. A. Ponder of the Alabama Department of Agriculture, published in 1957, describes the soils in the county.

TOPOGRAPHY AND DRAINAGE

Franklin County lies within the Coastal Plain and the Appalachian Plateaus physiographic provinces (Johnston, 1930). The Coastal Plain province is represented in the county by the Fall Line Hills of the East Gulf Coastal Plain section, and the Appalachian Plateaus province by the Cumberland Plateau section. The Cumberland Plateau section is divided into three districts – the Little Mountain, the Moulton Valley, and the Warrior Basin (fig. 2). This division differs from Fenneman's (1938, pl. III) in that it places the Little Mountain district in the Cumberland Plateau section of the Appalachian Plateaus province instead of in the Highland Rim section of the Interior Low Plateaus province.

The Fall Line Hills includes the western and central two-thirds of the county and is characterized by steep hills and deep-cut stream channels. Maximum relief is about 150 feet, and the highest altitudes are about 1,050 feet in the vicinity of Phil Campbell.

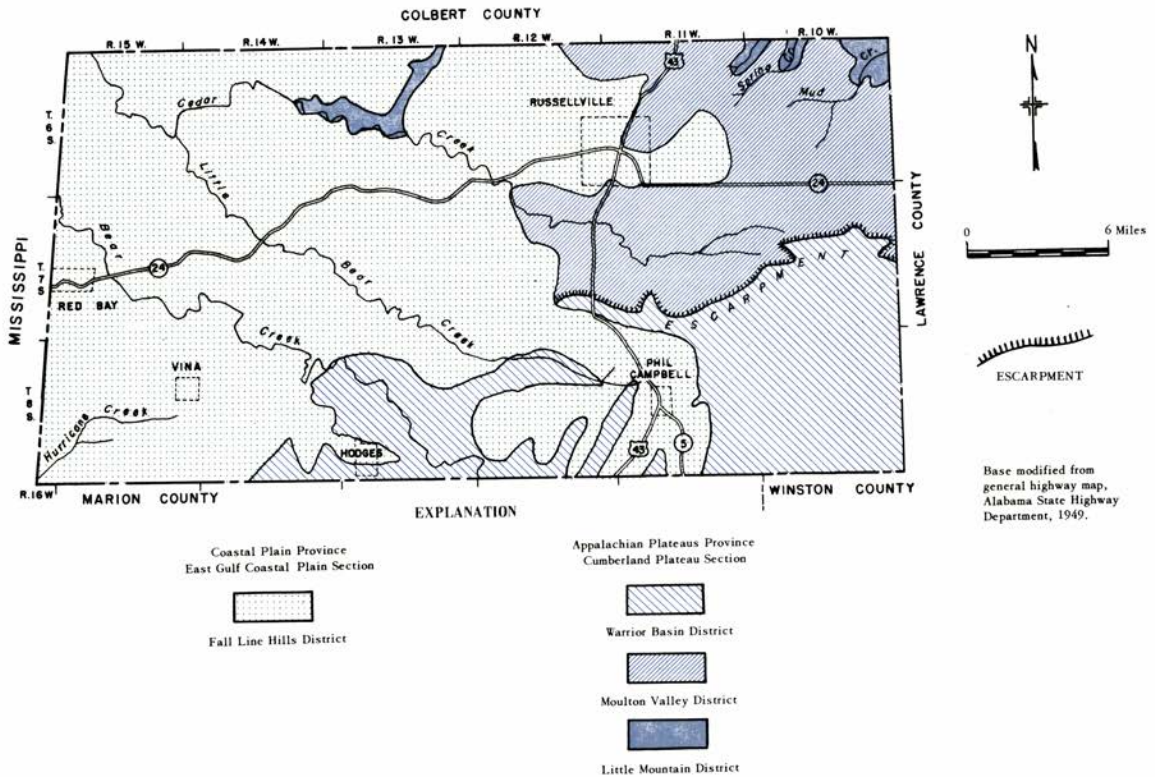


Figure 2.—Physiographic divisions of Franklin County.

The Little Mountain district includes several small areas along the Colbert County boundary where the Hartselle Sandstone crops out. It has a rolling to hilly terrane with maximum relief of about 100 feet.

The Moulton Valley district includes most of the northeastern part of the county. It is a rolling lowland of low relief; the average change of altitude is less than 50 feet except for a narrow belt along the south edge of the district, where the relief is about 150 feet. The maximum altitude is about 820 feet.

The Warrior Basin district is a dissected steep-sloped eroded plateau in the southeastern and south-central parts of the county. The boundary of the south-central part of the district is very irregular and at places indistinct, owing to the similarity of the friable sandstone in the Pottsville Formation and the sand beds in the Tuscaloosa Group. The relief is about 220 feet along Bear Creek, north of Hodges. The maximum relief of 330 feet and the highest points, about 1,150 feet above sea level, are along the escarpment near the Lawrence County boundary on the north edge of the district.

Franklin County is drained chiefly by Cedar, Little Bear, and Bear Creeks and their tributaries. These creeks flow parallel to each other from the east-central and southeastern parts of the county toward the northwest corner. A small area in the northeast corner of the county is drained by Mud, Spring, and Foxtrap Creeks, which flow northeastward. Headwaters of Hurricane Creek and several smaller creeks form in the extreme southwest corner of the county and flow southwestward into Marion County or into the State of Mississippi.

CLIMATE

Franklin County is in the northern climatic division of the State, north of lat 34°N. The climate is mild, and the temperature and precipitation are moderate.

The average annual precipitation from January 1954 to January 1961 was 49.73 inches, consisting mostly of rainfall. The average maximum monthly rainfall (5.88 inches) occurred in April, and the average minimum monthly rainfall (3.26 inches) occurred in August. Light snowfall occurs about three times a year. The average annual temperature is about 60 °F.

WELL- AND SPRING-NUMBERING SYSTEM

The numbering of wells and springs in Franklin County is based on the Federal system of land subdivision which divided the public land into townships approximately 36 square miles in area. In the numbering system used in this report, townships are designated by letters, in alphabetical order, beginning with "A" in the northeast township. The wells and springs within a township are numbered in the same order as the sections are numbered in a township, and in the records of wells and springs (table 5) each number is prefixed by the letter identifying the township; for example, M-1, M-2, M-3 (fig. 3).

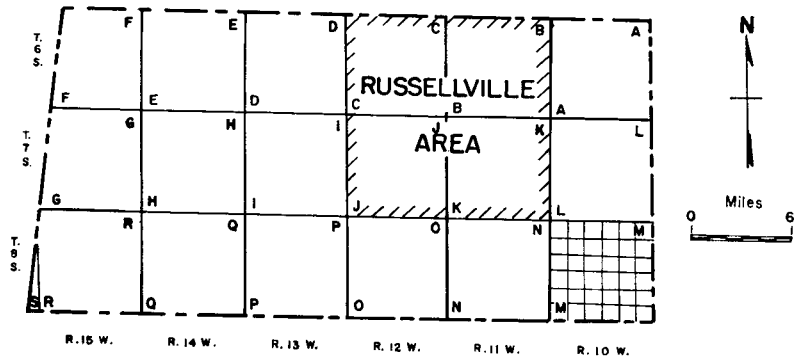
ACKNOWLEDGMENTS

Acknowledgment is made to the town officials of Hodges, Phil Campbell, and Red Bay, for furnishing information on their respective town's water supply and use; to Layne-Central Co. of Memphis, Tenn., H. W. Peerson Drilling Supply Co. of Birmingham, Ala., and Shook and Fletcher Co. of Russellville, Ala., for driller's logs and well-construction diagrams. Acknowledgment is made also to Mr. Thornton Lee, Superintendent of Education in Franklin County, for the data supplied on the county schools' water supply; to Mr. Jack Morris, geologist for U.S. Pipe and Foundry Co.; and to Mr. J. M. Richey of the U.S. Department of Agriculture and Mr. H. A. Ponder of the Alabama Department of Agriculture, who supplied pertinent information on the soils of Franklin County.

The author also expresses appreciation to the residents of Franklin County who furnished information on wells and springs, use of water, and other significant data.

GEOLOGY

Geologic formations exposed in Franklin County range in age from the Mississippian and Pennsylvanian consolidated rocks to the Late Cretaceous unconsolidated gravel. The formations of Mississippian age include the Hartselle Sandstone, Bangor Limestone, and Pennington Formation. The rocks of Mississippian age are overlain by the Pottsville Formation of Pennsylvanian age, and the Tuscaloosa Group of Late Cretaceous Age (pl. 1). Gentle folds are the principal geologic structures that occur in the consolidated rocks. Folds are common in the Hartselle Sandstone in



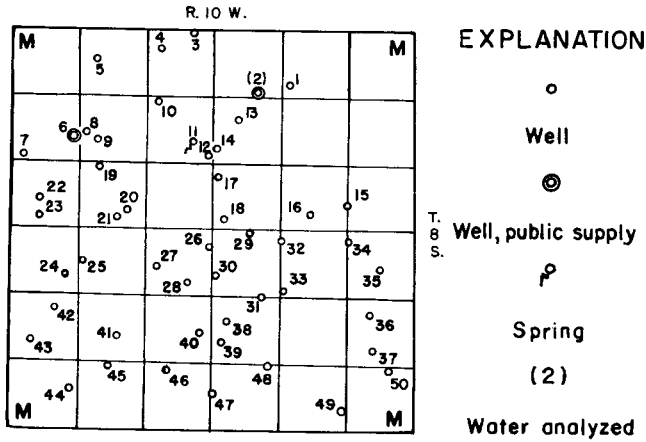


Figure 3.—Well- and spring-numbering system used in this report.

T. 6 S., R. 13 W., and to a lesser extent in the Pottsville Formation in T. 8 S., R. 14 W. The folds in the Hartselle Sandstone have a northwesterly trend (Semmes, 1929, p. 101). The dip of the rocks in Franklin County, based on the altitude of the top of the Hartselle Sandstone, is toward the south at about 57 feet per mile.

GEOLOGIC UNITS AND THEIR WATER-BEARING PROPERTIES

A generalized section of the geologic units and their water-bearing properties is shown in table 1.

The Tuscumbia Limestone and the Fort Payne Chert of Mississippian age and the Knox Dolomite of Late Cambrian and Early Ordovician Age occur below the Hartselle Sandstone and are reported to contain water that is high in chloride content (Bowles, 1941, p. 25, 27).

MISSISSIPPIAN SYSTEM

HARTSELLE SANDSTONE

The Hartselle Sandstone crops out in several places in the county along the Colbert County boundary (pl. 1). The Hartselle is generally a light-gray to yellowish-gray medium-grained to dense massive sandstone. At places the sandstone is calcareous or silty, or is thinly bedded and includes layers of gray shale. The thickness of the Hartselle ranges from 160 feet in the northern part of Franklin County to about 330 feet in the southern part, and averages about 210 feet. The exposed thickness is less than 50 feet.

The Hartselle Sandstone is a poor aquifer in Franklin County. Wells tapping the Hartselle generally yield less than 2 gpm (gallons per minute) and many are dry during periods of low water level. The chemical quality of water from the Hartselle generally is satisfactory for most uses, but locally the iron content may be high. The following hardness classification is used in this report:

Hardness range (parts per million)	Description
0-60	Soft
61-120	Moderately hard
121-180	Hard
181 and more	Very hard

Locally, water from the Hartselle may be hard or very hard because

Table 1.--*Geologic units in Franklin County and their water-bearing properties*

Unit	Thickness (average in feet)	Lithologic features	Water-bearing properties
Regolith	25	Residuum and alluvium, varicolored.	Adequate supply for domestic use. Some wells go dry during drought. Quality is good except in local areas where the water is very hard.
Tuscaloosa Group	---	Sand, clay, and gravel, yellow, red, purple, irregularly bedded.	Adequate supply for municipal and small industrial use. Quality is generally good.
Pottsville Formation	280	Sandstone, light-gray, fine- to coarse-grained, thin-bedded to massive, and medium-gray fissile to thin-bedded shale.	Adequate supply for municipal and small industrial use. Quality is good except in local areas where the iron content is high.
Pennington Formation	130	Limestone, light-gray, sandy or cherty, hard, crystalline, and dark-reddish-brown to greenish-gray shale interbedded with thin layers of crinoidal limestone.	Not an aquifer in Franklin County.
Bangor Limestone	500 (Southern part of county)	Limestone, light- to dark-gray, medium-crystalline to dense, crinoidal, oolitic, in part argillaceous, silty, and (or) cherty. The basal part is yellowish-gray calcareous shale interbedded with lenticular crinoidal limestone.	Adequate supply for domestic use in northeastern part of the county; adequate supplies for municipal use are available in the western part. Water is high in hydrogen sulfide in scattered areas.
Hartselle Sandstone	210	Sandstone, light-gray to yellowish-gray, medium-grained to dense, massive, in places silty or calcareous, or thinly bedded and includes layers of gray shale.	Poor aquifer; adequate supply for domestic use. Quality is good except in local areas where the iron content is high.

of movement of water from the overlying Bangor Limestone (table 5, A-1, A-24, D-6, E-4).

BANGOR LIMESTONE

The Bangor Limestone, which overlies the Hartselle Sandstone, is exposed in most of the northeastern part of Franklin County and along Cedar, Little Bear, and Bear Creeks and their tributaries in the western part of the county (pl. 1). The outcrops in the western part of the county are limited to the creek valleys and seldom are more than 1 to 1.5 miles wide. In the southern half of the county the thickness of the Bangor, determined from drill holes, averages about 500 feet. In the northern half of the county the Bangor thins rapidly toward the Colbert County boundary. The effect of pre-Cretaceous erosion in the northern half of Franklin County is evidenced by the eastward-trending escarpment across the east-central part of the county and the irregular profile (fig. 4) of the Bangor. Although the amount of data available is limited, it suggests that the surface of the Bangor is not as irregular in the southern half of the county as in the northern half (Welch, 1959), and that the topography does not necessarily reflect the configuration of the Bangor-Tuscaloosa contact.

The Bangor Limestone is overlain by the Tuscaloosa Group in the northern and western parts of the county and by the Pennington Formation in the southeastern and south-central parts.

There are many facies changes in the Bangor in Franklin County. In general, it consists of very light to dark-gray dense to medium crystalline crinoidal oolitic limestone, in part argillaceous, silty, and (or) cherty. The dark-gray dense crinoidal, in part cherty or argillaceous limestone is common in exposures north of T. 7 S., and the light-gray oolitic limestone occurs in the area between the eastward-trending escarpment in the east-central part of the county and the north edge of T. 7 S. Jones (1928) recorded many detailed sections of the oolitic limestone. The basal 25 to 120 feet of the Bangor is yellowish-gray calcareous shale interbedded with lenticular thick to thin-bedded crinoidal limestone. The shale and limestone are very fossiliferous, brachiopods and bryozoans being most abundant. Also occuring in the shale are the fossils *Prismopora serrulata*, *Pentremites brevis*, and *Pentremites pyramidatus* diagnostic of the Glen Dean Limestone in Kentucky. A more detailed study is needed to correlate the basal part of the Bangor in Franklin County with the formation in other areas.

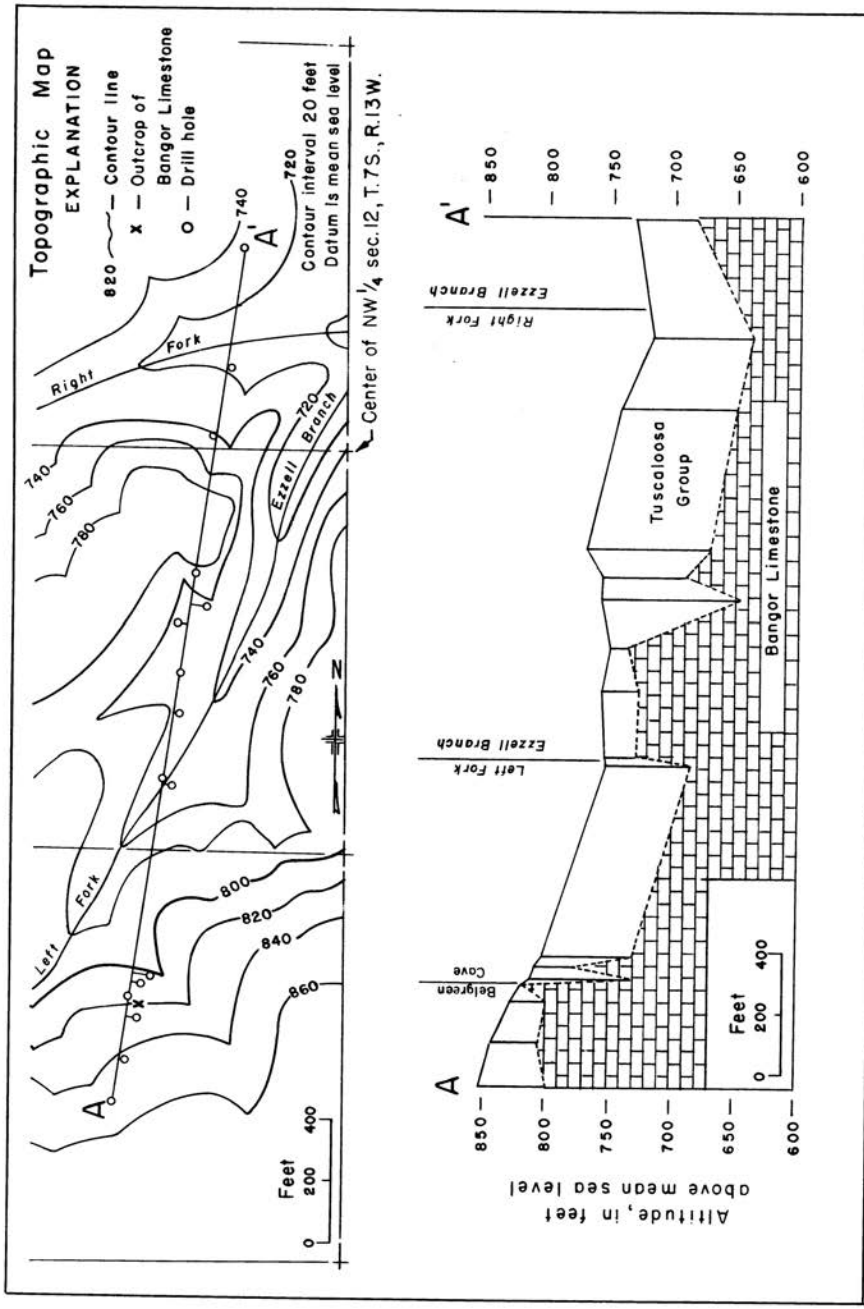


Figure 4.—Geologic section showing the Bangor Limestone—Tuscaloosa Group contact in sec. 12, T. 7 S., R. 13 W.

Many domestic supplies of water are developed from the Bangor in the northeastern part of the county. The dense limestone has only a few joints and bedding planes along which ground water can circulate; therefore, most of the supplies are of limited quantity and generally are developed at depths less than 100 feet below the land surface. In the western part of the county, supplies from the Bangor generally are larger because of (1) a thicker mantle of unconsolidated rock of the Tuscaloosa Group furnishing large storage capacity for ground water, and (2) a more vigorous pre-Cretaceous erosion leaving more channels and collapsed rock in the limestone, thereby aiding the movement of ground water. The quality of water from the Bangor is generally satisfactory for domestic use except in scattered places along Alabama Highway 24 east from Waco to Newburg and along U.S. Highway 43 north from Russellville to the Colbert County boundary, where there are noticeable amounts of hydrogen sulfide in the water. However, the sulfide content generally does not make the water unsatisfactory for domestic use. Although logs of several wells drilled into the Bangor in the southern half of the county are published (Bowles, 1941; McGlamery, 1955), only one (Bowles, p. 20) reports water data, and this log shows salt water in the limestone at a depth of 584 feet.

PENNINGTON FORMATION

The Pennington Formation crops out in Franklin County along the upper headwaters of Little Bear Creek about 6 miles south of Belgreen, and along the base of the escarpment to the Lawrence County boundary. Outcrops of the Pennington are rare because of slumpage from the overlying formations. Logs from wells in the southern part of the county show that the thickness of the formation generally ranges from 70 to 175 feet and averages 130 feet.

The Pennington consists of light-gray occasionally sandy or cherty hard crystalline limestone and dark-reddish-brown to greenish-gray shale interbedded with thin beds of crinoidal limestone. The shale generally denotes the base of the formation. There are no known water supplies obtained from the Pennington Formation in Franklin County.

The Pennington is the uppermost Mississippian formation in Franklin County and is overlain by the Pottsville Formation of Pennsylvanian age.

PENNSYLVANIAN SYSTEM

POTTSVILLE FORMATION

The Pottsville Formation in Franklin County is a repetitious series of medium- to light-gray fine- to coarse-grained thin-bedded to massive sandstones and medium-gray fissile to thin-bedded shales. It underlies most of the southeastern part of the county and some of the south-central part (pl. 1). Thin seams of coal occur in the formation in the southeast corner of the county. The Pottsville forms the eastward-trending escarpment from the Lawrence County boundary westward through the middle of T. 7 S. to about 2½ miles south of the community of Rockwood; farther west the escarpment is covered by sediments of Cretaceous age. The leading edge of the Pottsville may swing southward near the town of Vina. A sample log from a well about 2 miles south-southwest of Vina (McGlamery, 1955, p. 141) shows 70 feet of chert gravel and coarse sand (Tuscaloosa Group?) overlying the Pennington Formation, and the driller's log from well R-3 in Vina shows the Tuscaloosa Group overlying the Pennington.

The Pottsville Formation is represented in Franklin County by the lower strata, which have an average thickness of about 280 feet and a maximum thickness of about 480 feet. Exposures along the escarpment and along Bear Creek, about 2½ miles northeast of Hodges, are about 210-220 feet thick.

In general, wells tapping the Pottsville yield about 25 to 50 gpm; however, along the northern margin of the outcrop, where the recharge area is restricted by the escarpment, wells have lower yields.

The quality of water from the Pottsville is generally good. Locally the water contains excessive iron.

CRETACEOUS SYSTEM

TUSCALOOSA GROUP

The Tuscaloosa Group underlies about half the county and is predominant in the central and western parts (pl. 1). The Tuscaloosa consists of about 50 feet of light- to dark-yellow, red, and purple irregularly bedded sand, clay, and gravel. The gravel consists predominantly of rounded pebbles of chert and some limestone. Much of the group has been stained reddish brown by iron-bearing minerals precipitated from ground water. Brown iron ore

occurs locally in the Tuscaloosa where it is underlain by the Bangor Limestone. Mining and processing of the brown iron ore is the principal industrial operation in Franklin County.

Sands and gravels in the Tuscaloosa Group generally supply adequate amounts of water for domestic, industrial, and municipal use. Water from the Tuscaloosa Group is of satisfactory quality for domestic use, generally being low in hardness and chloride content; however, locally it is high in iron content.

QUATERNARY SYSTEM

REGOLITH

The regolith as used in this report includes all unconsolidated deposits except the Tuscaloosa Group and is restricted to the varicolored alluvial, colluvial, and residual deposits derived from the Hartselle Sandstone, Bangor Limestone, Pennington Formation, and Pottsville Formation (pl. 1). Regolith mantles the entire area of the above formations except for small, denuded outcrops of Bangor from Waco to the Lawrence County boundary. The surface features (soils) of the regolith are discussed on the detailed soil map of Franklin County (Brackeen and Ponder, 1956). The thickness of the regolith in the area underlain by limestone ranges from 0 to 40 feet and averages about 24 feet. The thickness of the regolith in the area underlain by sandstone ranges from 0 to 60 feet and averages 27 feet. Only the deeper dug wells were studied for this report, and therefore these thicknesses are probably too great.

A comparison of the median chloride contents and median hardnesses, based on field analyses (table 5), of water from the Bangor Limestone and the Pottsville Formation and of water in the regolith, reported in parts per million, is as follows:

	Bangor Limestone	Pottsville Formation
Chloride:		
Regolith	32	29
Bedrock	25	11
Hardness ($CaCO_3$):		
Regolith	180	70
Bedrock	220	20

The chemical quality of water in the regolith depends on the source from which the regolith was derived. For example, based on the above table, the hardness of water from the regolith formed on the Bangor is much higher than the hardness of water from the regolith formed on the Pottsville. The chloride content of water from the two formations generally is low.

GROUND WATER

Ground water is water below the land surface that flows from or is pumped from springs and wells. In Franklin County ground water is derived from precipitation, chiefly in the form of rain and occasionally in the form of snow. A part of the precipitation flows into streams and lakes as direct runoff, a part returns to the atmosphere through evaporation and transpiration, and a part seeps downward through the soil and rocks to become ground water.

This report contains data on ground-water use and recovery from 208 drilled wells, 164 dug wells, and 12 springs (table 5, pl. 2). Most of the drilled wells were constructed by cable-tool drills using 6- or 8-inch-diameter bits. In most of the wells constructed in limestone and sandstone areas, casing was installed through the regolith and seated in the bedrock. In the areas underlain by the Tuscaloosa Group, all drilled wells were cased and in a few of them (G-5, G-6, H-8), screens were installed. All dug wells were constructed by hand tools and range in diameter from 30 to 60 inches; most of them are 36 inches where cased and 40 inches where not cased. Cement tiles, rocks, or bricks were used for lining the dug wells. However, in many areas the walls of the wells do not cave in and casing is not required. Improvements, such as removal of debris, and construction of drainage ditches, storage basins, and springhouses, have been made on some of the springs.

OCCURRENCE, MOVEMENT, AND STORAGE

Ground water occupies interstices or open spaces in the soils and rocks of the earth's crust. According to their origin, these interstices can be divided into original and secondary. Original interstices are created as a result of the process by which the rock was formed, and secondary interstices are created by processes that affect the rock after it is formed. The size, shape, and arrangement of these voids affect the storage and movement of ground water.

The porosity of a rock is its property of containing interstices and can be expressed as a ratio, usually as a percentage, of the open space in a rock to its total volume. The permeability of a rock is defined as its capacity for transmitting water under pressure and is measured by the rate at which water is transmitted through a unit section under a unit hydraulic gradient. For large quantities of ground water to be obtained from wells and springs, the permeability must be high enough to permit water to move freely.

WATER-TABLE AND ARTESIAN CONDITIONS

A water table is the upper surface of a zone of saturation except where that surface is formed by an impermeable body such as shale, clay, or other material that confines the water under pressure. The zone of saturation is defined as a zone in which all the interstices or openings are filled with water. Artesian water is ground water that is confined under pressure by relatively impermeable overlying and underlying rocks. It occurs where rainfall and runoff have seeped into an aquifer and have passed between beds of clay or other relatively impermeable material.

In Franklin County ground water occurs under water-table conditions in the regolith, in part of the Tuscaloosa Group, and possibly in some of the Pottsville Formation and Hartselle Sandstone. It occurs under artesian conditions in the Bangor Limestone and in the Tuscaloosa, Pottsville, and Hartselle, where shale or clay layers confine the water under pressure.

The water table is not a level or stationary surface, but is a fluctuating, sloping surface depending on such factors as permeability, porosity, rock structure, topography, and irregularities in the rate at which water is recharged or discharged from the zone of saturation.

WATER-LEVEL FLUCTUATIONS AND THEIR SIGNIFICANCE

Water-level fluctuations are caused by ground-water recharge, natural discharge, evaporation, transpiration, withdrawals by pumping, variations in the atmospheric pressure, and other minor factors.

In Franklin County precipitation or lack of precipitation is the principal cause of water-level fluctuations. Water levels in shallow, water-table wells generally reflect rainfall faster than water levels in the deeper, artesian wells. Water levels are generally highest

during March and April, when rainfall is the most abundant and the evaporation rate is low. Conversely, during September and October, when rainfall is least abundant and the evaporation rate is high, the water levels are lowest. Many shallow wells are dry in the fall when the water table declines below the bottom of the wells.

Changes in water levels in wells I-8 and N-17 are shown in figure 5. Depths to water were measured during periods of high and low water levels and these data are shown, with monthly precipitation, in table 2.

RECOVERY

Ground water in Franklin County is recovered from wells and springs. About half these wells and springs are equipped with pumps; hand pumps or buckets are used on the others.

The withdrawal of water from a well produces a hydraulic gradient, causing water to flow from all directions toward the well and creating a depression in the water table or pressure surface. This depression, which has roughly the form of an inverted cone with its apex at the well, is known as the cone of depression. The greater the withdrawal from the well the greater the depth and breadth of the cone of depression. As pumping continues, the water levels continue to decline, at a decreasing rate, until the cone of depression extends to the limits of the water-bearing formation, or until there has been a capture of discharge or additional recharge in a quantity sufficient to halt development of the cone.

USE

Ground water in Franklin County is used for most domestic, stock, industrial, municipal, and school supplies, with the exception of some livestock supplies and the city of Russellville. Fifteen county schools are supplied by their own ground-water sources, 6 from springs, 8 from wells, and 1, the Frankfort School, using both a well (C-14) and a spring (D-10). The largest user is the school at Vina where a spring (Q-2) supplies about 500 students with all their needs and supplies irrigation water for the school's lawns and football field. The school at Rockwood is supplied from two springs (J-5 and J-29) that also supply the community of Rockwood and the stone-preparation plant.

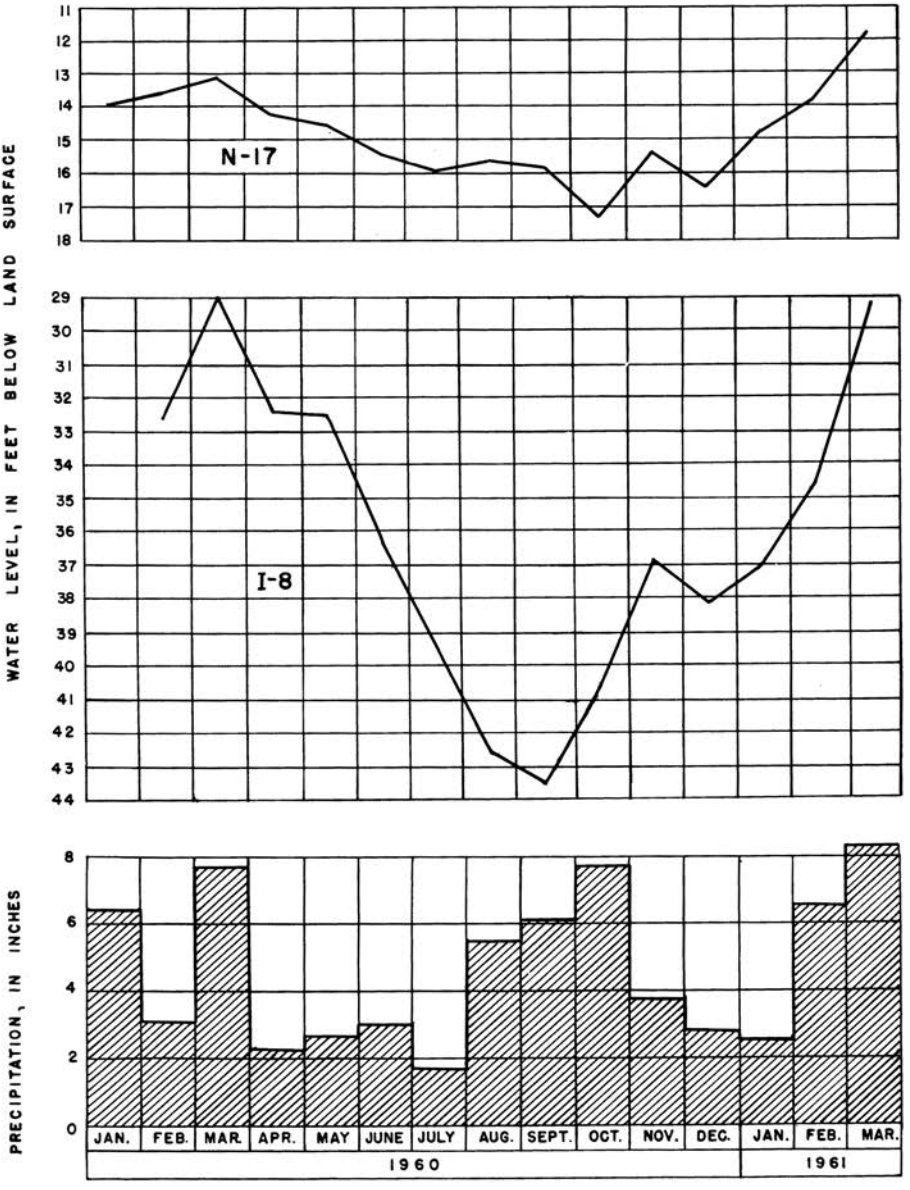


Figure 5.—Changes in water levels in wells I-8 and N-17 and precipitation at Russellville.

Table 2.--*Water levels in selected wells in Franklin County and precipitation at Russellville*

Type of well: D, drilled; Du, dug.

Depth to water level: In feet below land surface.

Water-bearing unit: Mh, Hartselle Sandstone; Mb, Bangor Limestone; IPpv, Pottsville Formation; Kt, Tuscaloosa Group; R, regolith.

Well no.	Type of well	Water-bearing unit	Date	Depth to water level (feet)	Date	Depth to water level (feet)	Date	Depth to water level (feet)
A-12	D	Mh	8-11-59	38.5	3-17-60	38.6	3-15-61	40.7
A-18	D	Mh	8-11-59	63.0	3-17-60	58.3	3-15-61	59.3
A-34	D	Mb	8-11-59	43.8	3-17-60	16.5	3-15-61	17.3
A-39	D	Mb	8-11-59	39.0	3-17-60	40.2	3-15-61	44.0
D- 2	D	Mb	8-20-59	53.1	3-16-60	53.0	3-15-61	49.9
I- 7	D	Kt	10-15-59	30.0	3-30-60	18.9	3-15-61	19.4
I-15	Du	Kt	10-16-59	28.2	3-30-60	21.5	3-15-61	22.3
I-19	Du	Kt	10-16-59	31.8	3-30-60	27.3	3-15-61	28.8
I-22	D	Mb	10-16-59	44.6	3-30-60	38.7	3-15-61	41.8
L-10	D	Mb	9-18-59	16.9	3-17-60	19.9	3-14-61	13.0
L-11	D	Mb	9-18-59	23.4	.....	...	3-14-61	13.3
L-12	D	Mb	9-18-59	38.8	3-17-60	22.8	3-14-61	23.6
L-31	D	IPpv	10-29-59	53.7	3-22-60	49.0	3-14-61	47.0
N- 3	Du	R	12- 7-59	17.2	3-22-60	7.6	3-14-61	9.9
N- 5	Du	Kt	10-28-59	20.8	3-22-60	5.3	3-14-61	7.5
N- 6	Du	Kt	10-28-59	14.9	3-22-60	5.4	3-14-61	5.3
N- 8	Du	Kt	10-27-59	19.7	3-17-60	9.9	3-13-61	13.1

N-19	Du	Kt	10-26-59	24.5	3-29-60	15.6	3-13-61	14.5
O- 2	D	Kt	10-26-59	16.6	3-29-60	8.7	3-13-61	6.1
O- 5	D	Ppv	10- 1-59	25.5	3-29-60	23.1	3-13-61	20.9
O- 7	D	Ppv	10- 2-59	18.2	.....	...	3-13-61	10.7

Precipitation at Russellville
(inches)

	1959	1960	1961
January	4.20	6.48	2.53
February	3.45	3.10	6.58
March	2.65	7.77	8.33
April	5.35	2.31	
May	4.62	2.66	
June	2.66	3.05	
July	2.38	1.76	
August	2.30	5.53	
September	1.14	6.10	
October	2.53	7.69	
November	4.04	3.80	
December	7.47	2.81	
Total	42.79	53.06	

The towns of Hodges, Phil Campbell, and Red Bay are supplied by ground water. The well (P-14) at Hodges supplies 18 business establishments, including a cafe and 2 service stations. Well N-31 at Phil Campbell supplies 350 families, the school (550 students), about 50 business places including service stations, and 7 chicken-houses. During March 1961, 2,176,700 gallons of water were withdrawn from well N-31 (table 3). In the town of Red Bay, 1 spring and 3 wells (G-11, G-12, G-13, and G-17) supplied about 32,360,000 gallons of water for about 2,000 people from September 1959 to September 1960.

Well G-6 supplies about 14,400 gpd (gallons per day) to Red Bay Lumber Co. for industrial use. This well in conjunction with wells G-5 and G-7 has supplied water to the Illinois Central Railway trains in past years. Johnston (1933, pt. 1. p. 216; pt. 2, table 18, wells 11, 12 and 13) inventoried three wells in the same area in which wells G-5, G-6, and G-7 were later drilled; however, the three original wells have been filled.

The use of ground water for stock and poultry is concentrated principally in the southern part of the county by the poultry farmers. In 1959 each of 139 poultrymen tended 1 to 28 poultry houses and averaged approximately 4 houses per man. The houses held from 5,000 to 12,000 chickens and averaged approximately 7,000 chickens.

QUALITY OF WATER

Water that falls as rain or snow contains only a small amount of dissolved matter. Upon reaching the ground, however, it begins to dissolve minerals from the regolith and rocks over which and through which it passes. The mineral composition of the rock and regolith and the time the water is in contact with them, the solvent ability of the water, and other factors determine the quality of the water. The more common constituents found in ground water are silica, iron, calcium, magnesium, sodium, potassium, bicarbonate, carbonate, sulfate, chloride, fluoride, and nitrate.

Field analyses were made to determine the hardness and chloride content of water from 233 wells and springs (table 5). Although field analyses are only approximations and may have some error, they are useful in a general comparison of hardness and chloride content of water from different geologic formations. Any apparent discrepancies in values of hardness and chloride between table 4 and table 5 are due in part to seasonal changes in water levels and

Table 3.—*Daily ground-water withdrawal from municipal well (N-31) at Phil Campbell, March 1961*

(in hundred gallons)

Date	Withdrawal [1]	Date	Withdrawal [1]
1	744	16	738
2	778	17	652
3	716	18	669
4	691	19	642
5	213	20	724
6	—	21	648
7	[2] 1,856	22	723
8	709	23	665
9	728	24	676
10	720	25	707
11	632	26	645
12	732	27	681
13	802	28	722
14	687	29	731
15	648	30	728
		31	760
		Total	21,767

Average withdrawal per day

Sunday	558
Monday [3]	736
Tuesday [4]	686
Wednesday	711
Thursday	727
Friday	705
Saturday	675

[1] Adjusted for reading at intervals of 24 hours.

[2] Includes withdrawal on March 6 and 7

[3] March 6 not included.

[4] March 7 not included.

to differences in laboratory and field techniques of analysis. A summation of the hardness and chloride content of ground water in Franklin County is as follows:

	Hardness as $CaCO_3$ (parts per million)			Chloride (Cl) (parts per million)		
	minimum	maximum	median	minimum	maximum	median
Regolith (25 samples)	10	815	95	4	255	32
Tuscaloosa Group (92 samples)	6	200	58	.2	230	25
Pottsville Formation (49 samples)	4	90	20	.5	87	11
Bangor Limestone (68 samples)	10	760	220	4	465	25
Hartselle Sandstone (15 samples)	12	320	80	11	125	18

The average temperature of ground water in Franklin County is about 61°F.

The chemical quality of water may limit its use for domestic, municipal, industrial, or irrigation supplies. Standards for drinking water established by the U.S. Public Health Service (1962) to control the quality of water supplied by common carriers generally are quoted as desirable for drinking water. According to these standards, supplies should not contain more than 0.3 ppm (part per million) of iron, 250 ppm of chloride, 250 ppm of sulfate, 0.8 to 1.7 ppm of fluoride (depending on the annual average of maximum daily air temperatures), 45 ppm of nitrate, and 500 ppm of total dissolved solids. The carbonate and bicarbonate content is not particularly significant in drinking or culinary water; sodium content is significant for those persons having an abnormal sodium metabolism. Calcium and magnesium are the principal constituents contributing to the hardness of water, and where present in excessive amounts, they are undesirable because of their scale-forming and soap-consuming properties.

Chemical analyses were made of 17 selected samples of ground water from five different geologic units in Franklin County (table 4). Constituents that were in excess of the recommended amounts were iron in wells A-13 and N-48, chloride in wells A-16, A-45, and A-49, and nitrate in well O-37. Excessive iron tends to stain materials with which it comes in contact; it can be tasted in concentrations

higher than 0.5-1.0 ppm. An abnormally high concentration of nitrate suggests possible pollution of an aquifer by waste materials. The analyses indicate that the remaining constituents are within the limits of the U.S. Public Health Service recommendations.

CONCLUSIONS

The results of the reconnaissance of the geology and groundwater resources of Franklin County are as follows:

1. The county is underlain by rocks included in the Hartselle Sandstone, the Bangor Limestone, and the Pennington Formation, all of Mississippian age; the Pottsville Formation of Pennsylvanian age; and the Tuscaloosa Group of Late Cretaceous Age. A mantle of regolith of Quaternary age covers most of the consolidated rocks of the county. Geologic structure is evident only in small folds in the north-central part of the county, and the regional dip of the formations is toward the south at about 57 feet per mile.

2. The Hartselle Sandstone does not yield water readily to wells. However, the water is generally of good quality, as it contains only small amounts of dissolved matter. The Bangor Limestone supplies sufficient water to wells for domestic supply. In some areas of the Bangor outcrop, the water contains noticeable amounts of hydrogen sulfide. A more detailed study is needed to correlate the basal part of the Bangor with formations in other areas. Wells tapping the Pottsville Formation or the Tuscaloosa Group yield about 25 to 50 gpm. The water is generally of good quality.

3. The Pennington Formation is not an aquifer in Franklin County.

4. A large amount of the water for domestic use is recovered from dug wells tapping the regolith, especially in the southern part of the county.

5. Ground water is recovered and used for approximately two-thirds of the county's needs. The city of Russellville and some livestock are supplied surface water. The towns of Phil Campbell and Red Bay, the business establishments of the town of Hodges, all the county schools, all the rural domestic users, the industrial plants at Red Bay and Rockwood, and most of the stock and poultry farmers use ground water.

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BASIC DATA

Table 4.—*Chemical analyses of water from selected wells and a spring in Franklin County, Ala.*

(Analyses by U.S. Geological Survey unless indicated otherwise)

Well and spring numbers correspond to those in plate 2 and table 5.

Water-bearing unit: Mh, Hartselle Sandstone; Mb, Bangor Limestone; IPpv, Pottsville Formation; Kt, Tuscaloosa Group.

Well or spring no.	Date of collection	Water-bearing unit	Parts per million											Specific conductance (micromhos at 25°C)	pH	Temperature (°F)
			Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Hardness as $CaCO_3$				
												Calcium, magnesium	Non-carbonate			
A-13	6- 6-60	Mh	3.00	2.2	1.7	5.5	10	0.8	12	0.0	0.0	12	4	64	7.0	...
A 13	2- 1-61	Mh		2.2	2.1	5.6	11	1.2	12	.1	.0	14	5	60	6.4	...
C-12	6- 8-60	Mb		51	35	10	296	19	22	.1	.1	271	28	539	8.1	61
G-13	6- 8-60	Kt		2.2	.6	1.1	13	1.2	.2	.0	.1	8	0	25	6.9	60
G-13	2- 2-61	Kt		2.2	.6	3.4	14	.4	1.0	.1	.1	8	0	32	6.6	...
I- 8	6- 7-60	Kt		20	.5	3.4	59	.8	3.5	.0	11	52	4	129	6.9	62
M- 2	6- 7-60	IPpv		.6	.6	2.4	4	.4	3.0	.0	5.1	4	0	22	6.2	...
M- 2	2- 2-61	IPpv		1.4	.6	2.6	7	.8	2.5	.0	5.2	6	1	28	6.4	...
[1] N-31	5-15-52	IPpv		.7	.8	.6	15.9	1.4	5.3	...	...	5.4	...	...	5.2	...
N-31	6- 7-60	IPpv		1.8	.4	1.4	8	.8	2.0	.0	.0	6	0	23	6.6	59
N-31	2- 2-61	IPpv		1.6	.7	1.7	9	1.2	2.0	.1	1.3	7	4	24	6.4	60
N-35	6- 7-60	IPpv		3.4	.7	2.2	13	5.2	2.5	.0	1.4	12	1	38	6.5	60
N-47	6- 7-60	IPpv	.24	1.0	1.5	.6	11	.8	.5	.0	.0	8	0	20	6.8	...
N-48	6- 7-60	IPpv	1.8	3.2	4.1	1.7	33	4.8	1.0	.1	.0	25	0	65	7.0	62
O-37	6- 7-60	Kt		7.2	5.8	145	0	3.2	150	.4	151	42	42	822	4.5	63
P-14	2- 2-61	IPpv		3.6	4.1	5.6	26	1.2	6.5	.1	13	26	4	91	6.8	...
Q- 2	6- 8-60	Kt		1.6	.4	1.1	7	.8	1.5	.0	1.2	6	0	19	6.6	60

[1] Analysis by Southern Testing Laboratories, Inc.

Table 5.—*Records of wells and springs in Franklin County*

Well or spring no.: Numbers correspond to those in plate 2 and tables 2 and 4; asterisk indicates chemical analysis given in table 4.
Type: D, drilled well; Du, dug well; Sp, spring.
Depth of well and water level; Depths shown in feet are reported; those shown in feet and tenths are measured.
Method of lift: G, gravity; M, manual; N, none; Pp, pitcher; Pv, sucker rod; T, turbine (deep well); Tj, jet; Ts, submersible.
Use of water: D, domestic; Ind, industrial; N, not used; P, public supply; S, stock.
Water-bearing units: Mh, Hartselle Sandstone; Mb, Bangor Limestone; IPpv, Pottsville Formation; Kt, Tuscaloosa Group; R, regolith.

Well or spring no.	Owner	Driller	Type	Depth of well (feet)	Diameter of well (inches)	Water-bearing unit	Altitude of land surface (feet)	Water level		Method of lift	Use of water	Field determinations			Remarks
								Above (+) or below land surface (feet)	Date of measurement			Temperature (°F)	Chloride (Cl) (ppm)	Hardness as $CaCO_3$ (ppm)	
A- 1	B. Gargis.....	.....	D	46.3	6	Mh	584	16.1	4- 7-60	M	D	62	46	170	Supply inadequate during dry season.
A- 2	.....do.....	U.S. Dept. of Agriculture.	D	76.4	6	Mh	589	15.7	4- 7-60	N	N	....	...	...	
A- 3	W. L. Mitchell ..	.....	D	34.2	6	Mh	585	8.6	4- 7-60	M	D,S	59	...	...	Supplies 1 family, 20 hogs, and 50 cows. Sulfurous taste reported when water level is low.
A- 4	M. E. Clement..	.....	D	44.9	6	Mb	620	12.4	4- 7-60	M	D	59	25	305	Muddy after rains.
A- 5	P. Holland.....	.....	D	54.3	6	Mb	595	9.6	4- 7-60	M	D	57	25	175	
A- 6	L. Landers	L. Landers....	D	29.5	6	Mb	618	3.5	4- 6-60	M	D	62	152	360	Supply inadequate during dry season.
A- 7	B. Aycock.....	.....	D	47.7	6	Mh (?)	605	6.2	4- 6-60	M	D	61	53	410	
A- 8	W. Aycock.....	B. Copeland Drilling Co.	D	59.5	6	Mb	605	34.6	4- 6-60	M	D	65	46	185	
A- 9	O. H. Aycock...	W. Copeland Drilling Co.	D	21.6	6	Mb	630	10.1	4- 6-60	M	D	....	...	...	Supply inadequate during dry season.

Table 5.–*Records of wells and springs in Franklin County*–Continued

Well or spring no.	Owner	Driller	Type	Depth of well (feet)	Diameter of well (inches)	Water-bearing unit	Altitude of land surface (feet)	Water level		Method of lift	Use of water	Field determinations			Remarks
								Above (+) or below land surface (feet)	Date of measurement			Temperature (°F)	Chloride (Cl) (ppm)	Hardness as $CaCO_3$ (ppm)	
A-10	O. H. Aycock...	W. Copeland Drilling Co.	D	70.7	6	Mh	580	29.0	4- 6-60	M	D	60	74	55	Supply inadequate during dry season. Sulfurous taste reported.
A-11	S. D. Hand.....	.....	D	61.4	6	Mh	605	40.1	8-11-59	M	D	63.5	18	20	Supply inadequate during dry season. Muddy after rains.
A-12	J. H. Aycock....	B. Copeland Drilling Co.	D	71.1	6	Mh	605	38.5	8-11-59	M	D	63	125	90	Cased to 17 ft. Water contains iron; muddy after rains.
*A-13	.....do.....	O. Copeland Drilling Co.	D	51.9	6	Mh	608	33.9	8-11-59	Tj	D	....	25	50	Cased to 14 ft. Water contains iron.
A-14	H. Aycock.....	.....	D	25.9	6	Mh, Mb (?)	609	5.1	4- 6-60	M	D	....	...	...	
A-15	J. H. Aycock....	B. Copeland Drilling Co.	D	69	6	Mh	605	15	8-11-59	Tj	D,S	....	...	...	Cased to 15 ft. Supplies 1 family and 14 cows. Water contains iron.
A-16	G. Pilgrim.....	.....	Du	22.9	36	R	645	7.6	7- 3-59	M	D	63	255	360	Cased to 22 ft. Supply inadequate during dry season. Water contains iron; muddy after rains.
A-17	W. V. Hatton....	.....	D	81.4	6	Mh	665	75.8	7-30-59	M	D	62	18	45	Supply inadequate during dry season. Muddy after rains.
A-18	R. Hatton.....	.....	D	89.3	6	Mh	635	63.0	8-11-59	M	D	63	25	80	Supplies 2 families.
A-19	N. A. Green.....	Harris Drilling Co.	D	82.3	6	Mb	629	16.6	4- 8-60	M	D	61	46	540	Rock crops out at surface. Supply inadequate during dry season; sulfurous taste reported.

A-20	H. McGuire	.....do.....	D	151.7	6	Mh (?)	640	56.8	4- 8-60	N	N	....	...	...	Cased to 6 ft. Driller reported yield of 1.5 gpm.
A-21	S. F. Bendall ...	W. See Drilling Co.	D	26.8	6	Mb	609	13.2	4- 6-60	M	D	62	46	390	Supply inadequate during dry season.
A-22	E. L. Vaughan..	.....	D	48.4	6	Mb	602	2.7	4- 8-60	M	D	....	...	...	Do.
A-23	W. Murray.....	W. Copeland Drilling Co.	D	35.1	6	Mb	588	11.1	4- 8-60	M	D	63	181	460	Cased to 8 ft.
A-24	C. Witt.....	.....	D	24.8	6	Mh	590	4.2	4- 7-60	M	D	59	25	225	Supplies 2 families; supply inadequate during dry season; sulfurous taste reported.
A-25	B. O. Counts....	.....	D	38.0	6	Mb	605	15.4	4- 8-60	M	D	....	...	...	Rock crops out at surface. Soda and lime taste reported.
A-26	W. Smith.....	.....	D	43.3	6	Mb	595	19.5	4- 7-60	M	D	62	18	40	Rock crops out at surface.
A-27	.....do.....	.....	D	75.3	6	Mb	602	24.1	4- 8-60	M	D	63	...	...	Do.
A-28	F. H. Myrck	Langford Drilling Co.	D	32.7	6	Mb	603	19.7	4- 8-60	M	D	....	...	...	Supply inadequate during dry season; sulfurous taste reported.
A-29	B. Aycock.....	.....	D	30.2	6	Mb	612	3.2	4- 8-60	N	N	....	...	...	
A-30	J. L. Carr.....	Kent Drilling Co.	D	46.0	6	Mb	610	9.9	4- 6-60	M	D	60.5	11	280	Cased to 11 ft. Supply inadequate during dry season; sulfurous taste reported.
A-31	R. Hill.....	.....	D	42.0	6	Mb	615	18.9	4- 8-60	N	N	....	...	...	
A-32	C. McGuire	McGuire Drilling Co.	D	44.8	6	Mb	610	15.0	4- 8-60	M	D	60	18	60	Cased to 4 ft. Water at 35 ft.; sulfurous taste reported.
A-33	C. Cook.....	C. McGuire....	D	41.6	6	Mb	613	9.6	4- 8-60	M	D	....	...	...	Rock crops out at surface. Supply inadequate; sulfurous taste reported.
A-34	O. L. Heaps....	Harris Drilling Co.	D	201.0	6	Mb	700	43.8	8-1 1-59	M	D	62	19	210	Cased to 40 ft. Supply inadequate.
A-35	M. Britnell.....	Mitchell Drilling Co.	D	48.3	6	Mb	665	41.6	7-28-59	Tj	D	....	25	340	Supply inadequate during dry season.
A-36	E. R. Fisher....	.....	Du	42.2	36	R	685	34.8	7-28-59	Tj	D	....	74	815	Cased to 42 ft. Supply inadequate during dry season; soda taste reported.
A-37	.....do.....	Daley Drilling Co.	D	41.8	6	Mb	690	28.8	7-28-59	M	D	63	96	760	Supply inadequate during dry season.

Table 5.—*Records of wells and springs in Franklin County*—Continued

Well or spring no.	Owner	Driller	Type	Depth of well (feet)	Diameter of well (inches)	Water-bearing unit	Altitude of land surface (feet)	Water level		Method of lift	Use of water	Field determinations			Remarks
								Above (+) or below land surface (feet)	Date of measurement			Temperature (°F)	Chloride (Cl) (ppm)	Hardness as $CaCO_3$ (ppm)	
A-38	Franklin County, Tharptown School.	.....	Sp	.....	....	Kt-Mb	660	.....	.....	Tj	P	63	11	180	Supplies 230 students and 1 church. Measured flow 2.5 gpm on 11-12-59.
A-39	O. Warhurst.....	Harris Drilling Co.	D	102.1	6	Mb	665	39.0	8-11-59	M	D	64	25	80	Supplies 2 families. Sulfurous taste reported.
A-40	S. Bradford.....	.....do.....	D	131.1	6	Mb	650	32.0	7-28-59	M	S	62.5	39	285	Used only to supply 2-3 cows. Soapstone taste reported.
A-41	H. Robinson....	Farley Drilling Co.	D	42.7	6	Mb	709	34.0	4- 6-60	M	D	62	209	240	Cased to 29 ft. Supply inadequate during dry season; muddy after rains.
A-42	F. McGuire.....	Saint Drilling Co.	D	66.0	6	Mb	631	22.5	4- 6-60	Tj	D	....	18	650	Sulfurous taste reported.
A-43	C. Hovatter.....	.....	D	63.0	6	Mb	610	15.2	4- 8-60	M	D	59	181	380	Do
A-44	R. Gaston.....	Saint Drilling Co.	D	89.6	6	Mb	608	15.0	4- 8-60	M	D	62	11	150	
A-45	J.L. Randolph..	.....	D	52.8	6	Mb	595	17.5	4- 6-60	M	D	64	457	70	Rock crops out at surface. Supply inadequate in dry season; soda taste reported.
A-46	H. Gaston.....	.....	D	48.0	6	Mb	630	28.2	4- 7-60	N	N	....	...	...	
A-47	L. D. Heaps....	Saint Drilling Co.	D	119.0	6	Mb	625	11.0	4- 6-60	N	N	....	...	...	Rock crops out at surface. Sulfurous taste reported.
A-48	A. H. Heaps....	U.S. Dept. of Agriculture.	D	92.7	6	Mb	613	8.4	4- 6-60	Pp	N	....	...	...	Rock crops out at surface.

A-49	C. Daniel, Jr....	Saint Drilling Co.	D	205	6	Mb, Mh (?)	654	62.2	3-28-60	Tj	S	....	465	85	Cased to 40 ft. Bedrock within 5 ft. of surface; casing sealed off small stream of water; sulfurous stream near bottom. Supplies 12 hogs. Driller reported bail test did not lower water level.
A-50	W. A. Turbeyfield.	.....	D	30.9	6	Mb	623	6.7	3-28-60	Tj	D	....	...	...	Supply inadequate during dry season.
A-51	Franklin County, Rocky Glen School.	.....	D	213	6	Mb	670	10	3- -60	Tj	P	....	90	185	Rock crops out at surface. Supplies 50 students.
A-52	J. S. Pride.....	Chipolett Drilling Co.	D	86.2	6	Mb	660	29.8	4- 6-60	M	D	62	11	160	
A-53	F. Phillips.....	Robinson Drilling Co.	D	88.0	6	Mb	665	40.6	4- 6-60	M	N	62	53	25	Supply inadequate for domestic use; salty taste reported.
A-54	W. King.....	Chipolett Drilling. Co.	D	65	6	Mb	672	16.2	7-29-59	Pp	D	62	4	110	Stream at 25-30 ft.
A-55	L. Hubbard.....	B. Copeland Drilling Co.	D	85	6	Mb	663	48	.....	Tj	D	....	18	15	Cased to 20 ft. Well originally drilled to 65 ft.; sulfurous stream between 65 and 85 ft.
A-56	L. E. Carlisle...	Chipolett Drilling Co.	D	96.4	6	Mb	670	48.6	7-29-59	M	D	63	46	15	Driller reported yield of 7 gpm. Sulfurous taste reported.
A-57	G. King.....	.....	D	27.7	6	Mb	672	17.3	7-29-59	M	D	62.5	11	70	Well used very little. Sulfurous taste reported.
A-58	J. Woods.....	.....	D	42.1	6	Mb	665	18.5	9-10-59	M	D	64	195	115	Supply inadequate during dry season; muddy after rains.
A-59	W. McKenney....	.....	Du	17.5	36	R	675	17.2	9-10-59	M	D	....	...	...	Supply inadequate during dry season.
A-60	W. Horton.....	.....	D	49.0	6	Mb	705	9.0	9-10-59	N	N	....	...	...	
A-61	C. Stout.....	Childs Drilling Co.	D	40.2	6	Mb	710	5.0	9-17-59	M	D	72	11	300	Rock crops out at surface. Supply inadequate during dry season; sulfurous taste reported; muddy after rains.

Table 5.—*Records of wells and springs in Franklin County*—Continued

Well or spring no.	Owner	Driller	Type	Depth of well (feet)	Diameter of well (inches)	Water-bearing unit	Altitude of land surface (feet)	Water level		Method of lift	Use of water	Field determinations			Remarks
								Above (+) or below land surface (feet)	Date of measurement			Temperature (°F)	Chloride (Cl) (ppm)	Hardness as $CaCO_3$ (ppm)	
A-62	Georgia Marble Co.	.....	D	40.4	6	Mb	702	16.5	3-31-60	M	D	57	18	295	Rock crops out at surface. Supplies 3 families; supply inadequate during dry season.
A-63	J. Nickoles.....	.....	D	80.3	6	Mb	760	52.0	3-28-60	Tj	D	....	53	435	Rock crops out at surface.
A-64	O. T. Green	.....	Sp	.....	....	Mb	750	.....	.....	Tj	P,S, D	63	11	160	Supplies Newburg School (50 students), 100 cows, and 4 families. Measured flow 38 gpm on 3-28-60.
A-65	L. Jackson.....	Chipolett Drilling Co.	D	117.0	6	Mb	645	14.8	3-28-60	M	D	58	124	310	Supply inadequate during dry season.
A-66	W. Harbin.....	.....do.....	D	88.0	6	Mb	638	12.3	3-28-60	Tj	D,S	....	96	10	Cased to 16 ft. Bedrock less than 5 ft. from surface. Supplies 33 cows. Freshwater stream at 40 ft.; sulfurous stream near bottom.
*C-12	O. E. Bolton....	Kent Drilling Co.	D	73.0	6	Mb	735	22.2	8-20-59	Tj	D,P	62.5	33	240	Supplies 2 families and store.
C-14	Franklin County, Frankfort School.	Chipolett Drilling Co.	D	.....	6	Mh	820	153.0	8-20-59	Tj	P	62	11	80	Supplies drinking water for 80 students; inadequate for all of school's needs; used in conjunction with D-10.
D- 1	W. M. King.....	.....	Du	22.7	36	R	660	18.4	8-20-59	N	N	....	...	...	Cased to 22 ft.
D- 2	Church of Christ, Shady Grove.	.....	D	.....	6	Mb	810	53.1	8-20-59	N	N	....	11	415	Supplied baptistery at one time.

D- 3	J. B. Daily.....	.....	D	57.5	6	Mh	635	12.9	6-13-60	M	D	62.5	11	85	Supply inadequate during dry season.
D- 4	O. W. Willingham	Kent Drilling Co.	D	85.4	6	Mb	627	48.6	6-15-60	M	N	62	11	290	Cased to 14 ft.
D- 5	.....do.....	.....	D	.....	5	Mh	605	12.3	6-15-60	Tj	D,S	....	...	...	Cased to 10 ft. Supplies 8 people and 23 hogs; copper taste reported. Stratigraphic test well by Owen Heath and D. L. Loveridge. No log.
D- 6	T. Taylor.....	B. Copeland Drilling Co.	D	94.6	6	Mh	600	37.6	6-13-60	Tj	D	....	11	145	Cased to 17 ft. Supplies 4 people. Water at 50 and 100 ft.; supply inadequate when used profusely.
D- 7	L. Taylor.....	.....	D	42.8	6	Mb	765	9.8	6-13-60	M	D	61	25	320	Muddy after rain.
D- 8	C. H. Greenhill..	Kent Drilling Co.	D	66.0	6	Mb	730	27.9	8-20-59	Tj	D	....	25	330	Cased to 6 ft.
D- 9	J. N. Sparks....	McGuire Drilling Co.	D	113	6	Mb	725	16	8- -59	Tj	D	....	...	...	Cased to 16.5 ft. Lime taste reported.
D-10	U.S. Pipe and Foundry Co.	.....	Sp	.....	....	Kt	800	.....	.....	Ts	P	59	4	125	Supplies Frankfort School, in conjunction with C-14. Measured flow 2 gpm on 12-3-59; 13 gpm on 2-16-60; 17 gpm on 3-30-60; 10 gpm on 5-23-60; and 1 gpm on 7-19-60.
D-11	F. Devaney.....	.....	Du	40.2	36	Kt	890	33.7	8-20-59	M	D	61	102	125	Cased to 40 ft.
D-12	Jo King.....	.....	D	49.3	6	Mb, Mh (?)	598	27.9	5-16-60	M	D	61.5	4	100	Rock crops out at surface. Water stains bucket black.
D-13	T. E. Hester....	Malone Drilling Co.	D	58.9	6	Mb	580	37.7	5-17-60	M	D	61.5	11	245	Used only for drinking water; Supply inadequate during dry season.
D-14	G. Hester.....	Chipolett Drilling Co.	D	158.8	6	Mb	600	10.6	5-17-60	M	D	60.5	53	370	Cased to 20 ft. Supply inadequate during dry season; soda and lime taste reported
D-15	.....do.....	.....	Du	27.3	44	Kt	700	19.9	8-20-59	M	D	....	...	...	Supply inadequate during dry season.
D-16	Molly Hester....	.....	Du	23.6	45	R	635	22.2	8-20-59	M	D	62	160	370	Supply inadequate one time in past 70 years.
D-17	W. C. Cain.....	.....	Du	19.9	36	R	620	10.7	8-20-59	M	D	65	32	125	

Table 5.–*Records of wells and springs in Franklin County*–Continued

Well or spring no.	Owner	Driller	Type	Depth of well (feet)	Diameter of well (inches)	Water-bearing unit	Altitude of land surface (feet)	Water level		Method of lift	Use of water	Field determinations			Remarks
								Above (+) or below land surface (feet)	Date of measurement			Temperature (°F)	Chloride (Cl) (ppm)	Hardness as $CaCO_3$ (ppm)	
D-18	A. Devaney.....	.....	Du	27.9	40	Kt	780	22.6	5-17-60	M	D	62	11	140	
D-19	R. Hester.....	Chipolett Drilling Co.	D	93.7	6	Mb	770	78.7	5-17-60	Tj	D	....	11	10	Supply inadequate for 5 people during dry season; sulfurous odor.
D-20	J. P. Johnson...	B. Copeland Drilling Co.	D	214	6	Mb, Mh (?)	623	94.2	5-17-60	M	D	60.5	...	...	Cased to 8 ft. Not used very much; soda taste reported.
D-21	J. T. Dempsey...	.....	Du	51.1	36	Kt	822	44.4	5-16-60	Tj	D	....	4	80	
D-22	J. O. Collum....	.....	Du	45.0	36	Kt	745	28.4	5-16-60	M	D	60.5	25	140	Supply inadequate during dry season.
D-23	J. D. Britton....	.....	Sp	.....	...	Mb	705	.....	.....	M	D	62	...	...	Measured flow 8 gpm on 12-1-59.
E- 1	T. Taylor.....	.....	D	51.0	6	Mb, Mh (?)	526	45.2	8- 2-60	M	D	63	96	60	Used only for drinking water; supply inadequate for other domestic use; lime taste reported.
E- 2	H. Jarnigan.....	.....	Du	19.0	40	R	545	14.6	5-15-60	M	D	....	...	...	Cased to 19 ft. Supply inadequate during dry season.
E- 3	G. McKenney....	.....	D	66.7	6	Mh	560	55.5	5-15-60	N	N	....	...	...	
E- 4	.....do.....	U.S. Dept. of Agriculture.	D	84.2	6	Mh (?)	542	30.5	5-15-60	Tj	D	....	11	320	Supplies 5 people.
E- 5	C. Taylor.....	.....	Du	19.8	36	R	622	14.9	5-15-60	M	D	59.5	18	110	Cased to 19 ft.
E- 6	D. Thorn.....	.....	D	46.7	6	Mb	555	10.3	5-16-60	M	N	59.5	18	400	Cased to 20 ft. Supply inadequate for domestic needs.
E- 7	R. L. West.....	Kent Drilling Co.	D	79.5	6	Mh	640	31.2	5-16-60	M	D	63	18	80	
E- 8	C. L. Petree....	.....do.....	D	75.6	6	Mb, Mh (?)	562	44.1	5-16-60	Tj	D,S	....	18	265	Cased to 12 ft. Supplies 5 people and 20 hogs.

E- 9	P. H. Hernidoff..	.....	Du	24.8	40	R, Kt (?)	642	21.4	5-16-60	M	D	59.5	32	450	Cased with square cement casing to 25 ft. Lime taste reported.
E-10	L. Kuykendall...	.....	Du	38.3	40	Kt	745	34.7	7-27-60	M	D	60	25	55	Supply inadequate during dry season; gas taste reported.
E-11	W. Jarnigan.....	Chipolett Drilling Co.	D	94.9	6	Mb	545	65.7	8- 2-60	Tj	D	....	32	350	Cased to 15 ft. Lime taste reported.
E-12	L. Bolton.....	.....	D	112.7	6	Mb	510	59.7	8- 2-60	M	D	62.5	11	150	Cased to 17 ft. Supply inadequate during dry season; lime taste reported.
E-13	F. Armstrong....	Chipolett Drilling Co.	D	111	6	Mb	543	60	7- -60	Tj	D,S	....	...	...	Supplies 1 family, 60 hogs, 6 cows, and 2,100 chickens; lime taste reported.
E-14	A. Spencer.....	.....	Du	37.0	40	Kt	805	31.9	5-16-60	Tj	D	....	...	...	Supply inadequate during dry season.
E-15	C. Wright.....	Kent Drilling Co.	D	126.2	6	Mb	538	65.6	8- 8-60	M	D	....	...	...	Rock crops out at surface.
E-16	E. Southward....	.....	Du	15.5	30	R	525	11.9	8- 8-60	M	D	63	40	180	Cased to 15.5 ft.
E-17	R. Dempsey.....	.....	Du	27.5	36	Kt	770	11.0	5-17-60	M	D	57	18	40	Cased to 27.5 ft. Water level low in dry season.
E-18	N. Guinn.....	.....	Du	56.1	36	Kt	790	47.2	5-17-60	M	D	62	32	110	Cased to 56 ft. Water level low in dry season; muddy after rain.
F- 1	E. Ezell.....	.....	Du	25.8	36	Kt	543	19.7	7-27-60	M	D	....	...	...	Cased to 26 ft. Supplies 10 people; water level low in 1954.
F- 2	R. E. Thorn	.....	Du	19.0	36	Kt	540	16.5	7-26-60	Pp	N	....	...	...	Supply inadequate for domestic needs.
F- 3	Franklin County, Pogo School.	.....	Du	.....	40 (?)	Kt	525	22.4	7-27-60	Pp	N	....	...	...	Supplied drinking water for students before school was abandoned.
F- 4	L. D. Petree....	.....	Du	29.8	40	R	575	26.2	7-27-60	N	N	....	...	...	
F- 5	W. R. Winchester	Chipolett Drilling Co.	D	83.5	6	Mb	525	38.9	8- 2-60	M	D	....	...	...	Cased to 7 ft. Lime taste reported.
F- 6	B. Malone.....	.....	Du	35.9	40	Kt	690	33.6	8-10-60	N	N	....	...	...	
G- 1	S. Morrow.....	.....	Du	18.2	36	R	550	14.2	8-10-60	Pv	D	....	11	20	
G- 2	N. A. Fallow....	.....	Du	27.0	48	Kt	605	22.7	8-11-60	Tj	D	....	...	...	Supply inadequate during dry season.
G- 3	J. B. Armstrong.	.....	Du	14.1	48	R	540	11.3	8-10-60	M	D	62	25	85	
G- 4	W. C. Stockton...	.....	Du	25.7	42	Kt	560	9.8	8-10-60	Tj	D	....	4	30	

Table 5.—*Records of wells and springs in Franklin County*—Continued

Well or spring no.	Owner	Driller	Type	Depth of well (feet)	Diameter of well (inches)	Water-bearing unit	Altitude of land surface (feet)	Water level		Method of lift	Use of water	Field determinations			Remarks
								Above (+) or below land surface (feet)	Date of measurement			Temperature (°F)	Chloride (Cl) (ppm)	Hardness as $CaCO_3$ (ppm)	
G- 5	H. Keeton.....	Layne-Central Co.	D	57	8	Kt	623	42	1943	T	N	63	25	56	Cased to 51.6 ft.; 6-in. screen from 51.6 to 56.0 ft.; well is gravel packed. Formerly used in conjunction with G-6 and G-7 to supply railroad trains.
G- 6	.....do.....	.....do.....	D	55.8	8	Kt	623	33.6	7-20-60	T	Ind	63	87	110	Cased to 51.3 ft.; 6-in screen from 51.3 to 55.6; well is gravel packed. Supplies about 14,400 gpd for steam boiler; air surge clean out made on 7-21-60 with 100 pounds per square inch compressor; pump delivered about 9 gpm to surface before surge test and about 60 gpm after surge test. Formerly used in conjunction with G-5 and G-7 to supply railroad trains.
G- 7	.....do.....	.....do.....	D	74	8	Kt	623	.....	.....	T	N	....	...	...	Formerly used in conjunction with G-5 and G-6 to supply railroad trains.
G- 8	L. McCarthy.....	.....	Du	41.5	36	Kt	575	37.7	8-10-60	M	D	62.5	11	20	Cased to 41.5 ft. Dry in fall of 1958.

G- 9	P. Morgan.....	.....	Du	15.9	36	R	533	13.9	8-10-60	Tj	D	....	...	...	Cased to 16 ft. Supply inadequate during dry season.
G-10	F. Buell.....	.....	Du	44.9	40	Kt	700	41.0	8-12-60	M	D	....	...	...	Supply inadequate during dry season.
G-11	Town of Red Bay.	.....	Sp	.....	....	Kt	502	.....	.....	G	P	....	...	...	Used in conjunction with G-12, G-13, and G-14 to supply town of Red Bay (2,000) people); from September 1959 to September 1960 about 32,360,000 gallons of water was pumped into the municipal system from the 4 sources.
G-12	Town of Red Bay.	Webb Drilling Co.	D	42	6	Kt	500	.....	.....	T	P	....	...	...	Municipal supply.
*G-13	.....do.....	Norris Drilling Co.	D	40	6	Kt	498	.....	.....	T	P	60	...	...	Do.
G-14	.....do.....	Webb Drilling Co.	D	45	6	Kt	500	.....	.....	T	P	....	...	...	Do.
G-15	G. S. Bullen....	.....	Du	49.0	36	Kt	745	46.0	8-11-60	M	D	....	...	...	Used very little.
G-16	J. E. Spencer...	.....	Du	46.9	40	Kt	710	41.1	8-12-60	M	D,S	62.5	25	100	Supplies 10 people and minimum of 10 hogs.
G-17	G. Hester.....	.....	Du	23.9	40	Kt	765	20.8	8-12-60	M	D	60.5	32	105	Supply inadequate during dry season.
H- 1	M. M. Guinn.....	.....	Du	46.5	36	Kt	785	39.0	5-17-60	M	D	63	53	75	Cased to 46.5 ft. Supply inadequate during dry season.
H- 2	L. Hester.....	.....	Du	35.5	36	Kt	722	31.8	8-10-60	M	D,S	62	25	30	Cased to 35.5 ft. Supplies Grade B dairy barn for 7 cows.
H- 3	E. R. Shewbart..	.....	Du	53.8	36	Kt	700	47.5	8- 8-60	Tj	D,S	....	25	40	Cased to 16 ft. Supplies 1 family and 8,000 chickens.
H- 4	B. R. Fennel....	Chipolett Drilling Co.	D	200	6	Mb	615	57.6	8- 8-60	Tj	D	....	...	...	Cased to 27 ft.
H- 5	.....do.....	.....do.....	D	167.2	6	Mb	615	102.0	8- 8-60	Tj	S	....	11	160	Cased to 30 ft. Supplies 13,000 chickens.
H- 6	W. A. Barksdale	.....	D	39.5	6	Mb	559	19.1	8- 8-60	M	N	63	25	205	Lime taste reported. Quality of water reportedly unfit for use by stock.
H- 7	D. Shewbart.....	.....	Du	87.3	36	Kt	752	80.4	8- 8-60	Tj	D	....	4	80	Cased to 87 ft.

Table 5.—*Records of wells and springs in Franklin County*—Continued

Well or spring no.	Owner	Driller	Type	Depth of well (feet)	Diameter of well (inches)	Water-bearing unit	Altitude of land surface (feet)	Water level		Method of lift	Use of water	Field determinations			Remarks
								Above (+) or below land surface (feet)	Date of measurement			Temperature (°F)	Chloride (Cl) (ppm)	Hardness as $CaCO_3$ (ppm)	
H- 8	G. W. Elliott.....	Baird Drilling Co.	D	160	6	Kt	710	.....	.....	Pv	D	....	4	200	Cased to 100 ft.; 6-in. (?) Screen from 140 to 144 ft.
H- 9	R. Bolding.....	.....	Du	91.5	36	Kt	680	39.3	8-10-60	Tj	D	....	11	50	Cased to 44 ft.
H-10	Weatherford Estate.	.....	Sp	.....	...	Kt	590	.....	.....	G	D	65	11	20	Supplies 22 people. Estimated flow 5 gpm on 8-10-60.
H-11	J. Reed.....	.....	Du	17.4	40	Kt	605	14.7	8-11-60	M	D	66	53	35	Dry in fall.
H-12	G. Berry.....	Baird Drilling Co.	D	100.4	6	Mb	618	70.1	8-11-60	M	D	62.5	25	160	Cased to 40 ft. Kt-Mb contact at 40 ft. Supply inadequate for uses other than drinking.
H-13	W. O. Hall.....	.....	D	101.5	6	Mb	530	36.6	8- 5-60	Tj	D	....	25	185	Lime taste reported.
I- 1	J. H. Hester....	Chipolett Drilling Co.	D	253	6	Kt	840	25	9- -59	Tj	D,P	....	25	160	Cased to 60 ft.; limestone at 59 ft. Supplies 2 families and store; seep water only; well can be pumped dry with a ½-hp pump.
I- 2	Church of Christ, Belgreen.	.....do.....	D	150	6	Mb	850	104.1	10-15-59	Tj	D,P	....	...	...	Supplies 1 family and baptistery. Lime taste reported.
I- 3	R. H. Tompkins.	.....	Du	52.1	36	Kt	818	51.0	10-15-59	N	N	....	...	...	
I- 4	A. D. Brittan...	.....	Du	26.3	36	Kt	640	19.5	10-15-59	Tj	D	63	11	160	Cased to 26.5 ft.
I- 5	J. B. Hester, Jr..	Chipolett Drilling Co.	D	81	6	Mb	820	65.3	10-15-59	Tj	D	....	25	200	Well can be pumped dry with a ½-hp pump.

I- 6	C. C. Schbort...	.....	Du	37.8	36	Kt	830	32.5	5-16-60	M	D	60	11	80	Supply inadequate during dry season.
I- 7	S. T. Hargett...	U.S. Pipe and Foundry Co.	D	31.5	6	Kt	860	30.0	10-15-59	N	N	....	...	...	Reported depth 56 ft.
*I- 8	J. Thorne.....	.....	Du	80.5	36	Kt	860	43.2	10-21-59	Tj	S	62	25	130	Cased to 80.5 ft. Supplies 100 or more cows and hogs. Used as monthly observation well (fig. 5).
I- 9	A. D. Dempsey..	.....	Du	37.6	40	Kt	870	34.2	5-17-60	M	D	60	18	100	
I-10	D. Bragwell....	.....	Du	46.2	40	Kt	805	39.7	5-17-60	M	D	60	32	45	Muddy after heavy rain.
I-11	W. A. Benson ..	.....	Du	46.6	40	Kt	788	35.5	5-17-60	Tj	D	....	32	125	Supply inadequate during fall of 1954.
I-12	J. H. Entrekin..	.....	Du	38.6	36	Kt	870	31.5	5-15-60	Tj	D	....	...	...	
I-13	R. Hargett.....	.....	Du	.....	36	Kt	920	47.0	10-16-59	M	N	62.5	25	180	
I-14	.....do.....	.....	Du	39.5	40	Kt	905	30.2	10-16-59	M	D	....	...	...	Muddy after rain.
I-15	G. Porter.....	.....	Du	32.6	36	Kt	890	28.2	10-16-59	M	D	63	25	65	
I-16	T. J. Sumeral...	.....	Du	29.0	36	Kt	880	26.8	10-16-59	M	D	63	11	60	
I-17	A. B. Getty....	.....	Du	37.4	36	Kt	885	34.7	10-21-59	M	D	63	32	50	Supply inadequate during dry season.
I-18	H. Heats.....	.....	Du	26.7	36	Kt	900	24.2	10-21-59	N	N	....	...	...	
I-19	T. J. Sumeral..	.....	Du	36.5	36	Kt	885	31.8	10-16-59	M	D	64	25	50	
I-20	T. C. Sumeral .	.....	Du	35.4	36	Kt	880	30.0	10-16-59	M	D	63	117	140	
I-21	J. Brown.....	.....	Du	26.6	36	Kt	865	23.3	10-16-59	M	D	64.5	39	140	Supplies 3 families.
I-22	B. Briton.....	Kent Drilling Co.	D	67.2	6	Mb	657	44.6	10-16-59	M	N	63	18	300	Water stains buckets and casing black. No taste or odor of sulfur.
J- 5	J. G. Rikard...	.....	Sp	.....	...	Mb	660	.....	.....	G to Pv	P Ind	62.5	...	...	Estimated flow 40-50 gpm on 11-24-59. Used in conjunction with J-29 to supply school (120 students), community of Rockwood, and the stone-preparation plant. (Johnston, 1933, table 19, no. 43).
J-29	Georgia Marble Co.	.....	Sp	.....	...	Mb	678	.....	.....	G to Pv	P Ind	62	...	...	Used in conjunction with J-5.

Table 5.—*Records of wells and springs in Franklin County*—Continued

Well or spring no.	Owner	Driller	Type	Depth of well (feet)	Diameter of well (inches)	Water-bearing unit	Altitude of land surface (feet)	Water level		Method of lift	Use of water	Field determinations			Remarks
								Above (+) or below land surface (feet)	Date of measurement			Temperature (°F)	Chloride (Cl) (ppm)	Hardness as $CaCO_3$ (ppm)	
K-46	N. King.....	Woodward Oil and Gas Co.	D	2,560	12	Mb-Mh	697	.....	.....	N	N	....	...	...	Oil test well; fresh water at 265 ft. (Mb), and 475 ft. (Mh); salt water at 2,295 ft. and below (Knox Dolomite). Well sealed 1-26-60.
L- 1	V. Hargett.....	.....	D	59.6	6	Mb	718	3.5	3-28-60	M	D	61	11	400	Cased to 20 ft.; bedrock crops out at surface. Well dry in fall of 1954.
L- 2	D. Long.....	Saint Drilling Co.	D	35	6	Mb	645	3.9	3-28-60	Tj	D,S	....	18	200	Supplies 1 family and 50 cows.
L- 3	L. Rowe.....	.....	D	33.8	6	Mb	664	8.6	3-28-60	M	D	64	67	315	Bedrock crops out at surface. Supplies 3 families.
L- 4	H. Wood.....	.....	D	45.3	6	Mb	680	13.8	3-28-60	Tj	N	....	...	...	Bedrock crops out at surface. Supply inadequate for domestic use.
L- 5	W. Smith.....	.....	D	46.2	6	Mb	650	21.5	3-28-60	M	D	62	60	385	Bedrock crops out at surface.
L- 6	W. King	.....	D	47.5	6	Mb	705	4.8	3-31-60	M	D	57	145	155	Bedrock crops out at surface. Supplies 4 families; lime taste reported.
L- 7	B. Manley.....	.....	D	59.4	6	Mb	728	1.5	3-31-60	N	N	....	...	...	Bedrock crops out at surface. Supply inadequate for domestic use.
L- 8	A. B. Hall.....	.....	D	147.5	6	Mb	726	1.8	9-10-59	M	N	72	18	120	Bedrock crops out at surface. Sulfurous stream below 50 ft.

L- 9	M. R. McClandhand.	Robinson Drilling Co.	D	90	6	Mb	760	32.3	9-18-59	Tj	D	....	18	340	Cased to 2 ft. Supplies 2 families; can be pumped dry with a ½-hp pump; water in 2 streams, bottom stream is sulfurous.
L-10	R. McGee.....	Saint Drilling Co.	D	49.6	6	Mb	762	16.9	9-18-59	M	D	63	18	290	Cased to 5.5 ft. Supplies 2 families, supply inadequate for profuse use; sulfurous and lime taste reported; sulfurous stream at 48 ft.
L-11	L. Farned.....	.....	D	51.3	6	Mb	765	23.4	9-18-59	M	D	....	...	...	Cased to 6 ft.
L-12	E. Potter.....	.....	D	120.0	6	Mb	755	38.8	9-18-59	Tj	D	....	32	280	Drawdown was 7.6 ft. after pumping 2 minutes by a ¼-hp pump on 9-18-59.
L-13	J. Farned.....	.....	D	54.6	6	Mb	758	8.3	9-18-59	M	D	71	11	255	Reported depth 72 ft. Muddy after rain; lime taste reported.
L-14	G. Richeson...	.....	D	58.8	6	Mb	778	1.7	4- 4-60	N	N	....	...	...	Cased to 8 ft. Supply inadequate for domestic use.
L-15	L. Jackson....	Chipolett Drilling Co.	D	142.6	6	Mb	795	7.7	3-31-60	Tj	D	....	...	...	Used only in summer.
L-16	S. McBrayer...	.....	D	27.2	6	Mb	665	9.9	2-28-60	Tj	D,S	...	11	175	Supplies 1 family; has been used for Grade B dairy barn.
L-17	R. See.....	Cole and Haney Drilling Co.	D	37.2	6	Mb	690	10.0	3-28-60	M	D	....	...	...	Supply inadequate during dry season.
L-18	J. W. Fleming..	Thomas Drilling Co.	D	22.9	6	IPpv	1,050	10.3	4- 4-60	M	D	58	32	90	Cased to 14 ft.; reported depth 34 ft. Supply inadequate during dry season.
L-19	C. Cunningham.	Kent Drilling Co.	D	159.0	6	IPpv	1,040	72.2	3-31-60	M	N	....	...	...	
L-20	J. Woodall.....	.....do.....	D	84.4	6	IPpv	1,060	50.9	3-31-60	M	D	64	4	25	Cased to 32 ft.
L-21	D. Sims.....	.....	D	98.3	6	IPpv	1,050	27.1	4- 4-60	Tj	S	....	18	35	Cased to 17 ft. Supplies 17,000 chickens and 30 hogs.
L-22	C. Weeks.....	U.S. Dept. of Agriculture.	D	51.3	6	IPpv	1,070	25.5	4- 4-60	Tj	D,S	....	18	25	Supplies 1 family and 6,000 chickens.
L-23	W. L. Morgan...	W. L. Morgan...	D	34.8	6	IPpv	1,050	16.5	4- 4-60	M	D	62	11	20	Cased to 4 ft. 1.5 gpm iron in solution.
L-24	R. R. Kiser....	.....	D	71.0	6	IPpv	1,040	57.0	4- 4-60	Tj	D	....	11	20	Iron precipitate in sample.

Table 5.—*Records of wells and springs in Franklin County*—Continued

Well or spring no.	Owner	Driller	Type	Depth of well (feet)	Diameter of well (inches)	Water-bearing unit	Altitude of land surface (feet)	Water level		Method of lift	Use of water	Field determinations			Remarks
								Above (+) or below land surface (feet)	Date of measurement			Temperature (°F)	Chloride (Cl) (ppm)	Hardness as $CaCO_3$ (ppm)	
L-25	D. C. Miller.....	.....	D	26.0	6	IPpv	1,050	8.8	4- 4-60	Pv	D,S	....	...	...	Supplies 1 family and 24,000 chickens.
L-26	I. Duboise.....	Baird Drilling Co.	D	149.0	6	IPpv	1,020	49.3	3-23-60	Tj	D,S	....	11	20	Cased to 55 ft. Supplies 1 family and 6,000 chickens; can be pumped dry by a ½-hp pump.
L-27	D. Baker.....	.....do.....	D	138.3	6	IPpv	1,045	89.2	10-29-59	Tj	S	....	4	40	Cased to 20 ft. Supplies 30 hogs; copper taste reported; reddish color.
L-28	W. Garrison.....	.....do.....	D	140	6	IPpv	1,030	85.5	10-29-59	Tj	D	....	...	...	Cased to 22 ft. Reddish color.
L-29	Franklin County, Enterprise School.	.....	Du	25	36	R	1,025	24.3	10-29-59	Tj	P	....	11	10	Supply inadequate for 60 students; pumped dry by a ½-hp pump.
L-30	S. M. Newell....	.....	Du	20.2	36	R	1,025	18.6	10-29-59	Tj	D	....	...	...	Supply inadequate during dry season.
L-31	W. S. Taylor....	.....	D	69.0	8	IPpv	980	53.7	10-29-59	M	D	....	...	...	Cased to 30 ft. Reported depth 95 ft.
L-32	W. K. Wimberly..	.....	D	33.9	8	IPpv	1,030	18.6	4- 1-60	M	D	58	18	30	Supply inadequate during dry season.
L-33	S. Trapp.....	Kent Drilling Co.	D	32.2	6	IPpv	1,020	3.7	4- 1-60	Tj	D,S	....	25	80	Cased to 1.5 ft. Supplies 1 family and 6,000 chickens.
L-34	J. D. Willingham	.....do.....	D	50.8	6	IPpv	1,045	15.8	4- 1-60	Tj	D,S	....	...	...	Cased to 20 ft. Supplies 1 family and 12,000 chickens. Sand in water.
L-35	H. Gann.....	.....	D	73.2	6	IPpv	1,055	67.7	4- 4-60	M	N	....	...	...	Not used owing to broken glass in well.

M- 1	E. Sherwood....	Kent Drilling Co.	D	68.8	6	Ppv	1,040	44.0	4- 4-60	Tj	D	....	....	....	Cased to 8 ft. Reported bail test of 1,400 gallons per hour, August 1959.
*M- 2	Franklin County, Union School.	Godsley Drilling Co.	D	96	6	Ppv	1,060	67.3	4- 1-60	Tj	P	....	18	20	Supplies lunchroom and bathrooms for 200 students.
M- 3	G. Wynn.....	Morgan Drilling Co.	D	48.4	6	Ppv	1,060	34.8	4- 1-60	M	D	62	25	80	Muddy after rain or after bailing water.
M- 4	H. Kimbrough...	.....	D	26.3	6	Ppv	1,010	4.0	4- 1-60	M	D	59	25	20	
M- 5	T. W. Trapp....	.....	D	38.7	6	Ppv	1,017	10.3	4- 1-60	Tj	D	....	18	25	Cased to 20 ft.
M- 6	Franklin County, Trapptown School.	Godsley Drilling Co.	D	68.0	6	Ppv	1,020	39.7	12- 7-59	Tj	P	....	11	20	Supplies drinking water and bathroom for 39 students.
M- 7	M. L. Thomas...	Taylor Drilling Co.	D	67.9	6	Ppv	1,000	31.0	4-29-60	M	D	60.5	67	60	Supply inadequate during dry season.
M- 8	E. Trapp.....	.....	D	28.0	6	Ppv, R (?)	1,010	23.3	12- 7-59	M	D	....	....	....	
M- 9	J. Oden.....	.....	Du	21.9	40	R	983	16.2	12- 7-59	Tj	D	64	32	95	Do.
M-10	C. C. Kimbrough	.....	D	69.3	6	Ppv	1,025	55.8	4- 1-60	Tj	D,S	....	....	....	Supplies 2 families and 6,000 chickens.
M-11	V. Oliver.....	.....	Sp	.....	...	Ppv	920	.....	.....	N	N	63	....	....	Bubbling Spring. Measured flow 125 gpm on 12-10-59.
M-12	.....do.....	.....	D	99.8	6	Ppv	1,045	93.9	12-10-59	N	N	....	....	....	
M-13	W. F. Johnson...	Thomas Drilling Co.	D	102	6	Ppv	1,045	85.1	12-10-59	N	N	....	....	....	Cased to either 69 or 79 ft. very weak stream at 40 ft.; small stream about 100 ft.; coal and iron taste reported. Coal seam at about 90 ft.
M-14	V. Oliver.....	Godsley Drilling Co.	D	97	6	Ppv	1,040	.....	.....	Tj	D,S	....	....	....	Supplies 1 family and 12 cows.
M-15	D. Davis.....	Baird Drilling Co.	D	70.9	8	Ppv	955	20.6	12-10-59	Tj	D,S	....	....	....	Supplies 1 family and 12,000 chickens.
M-16	W. T. Porter....	.....	Du	37.3	40	R	945	33.5	12-10-59	Tj	D,S	....	....	....	Supplies 1 family and 10,000 chickens.
M-17	J. W. Oliver....	Godsley Drilling Co.	D	127	6	Ppv	1,042	107	7- -59	Tj	D	....	....	....	Cased to 35 ft. Supplies 2 families.
M-18	E. P. Porter....	.....	Du	63.3	40	R	955	62.0	12-10-59	Tj	D	....	32	185	Supply inadequate once since 1945.
M-19	N. G. Landers...	.....	Du	34.3	40	R	980	28.3	12- 7-59	Tj	D	....	4	55	Supply inadequate during dry season.

Table 5.—*Records of wells and springs in Franklin County*—Continued

Well or spring no.	Owner	Driller	Type	Depth of well (feet)	Diameter of well (inches)	Water-bearing unit	Altitude of land surface (feet)	Water level		Method of lift	Use of water	Field determinations			Remarks
								Above (+) or below land surface (feet)	Date of measurement			Temperature (°F)	Chloride (Cl) (ppm)	Hardness as $CaCO_3$ (ppm)	
M-20	K. Pinkard.....	.....	D	88.9	6	IPpv	985	76.7	12- 9-59	M	D	63.5	11	8	Cased to 4 ft.
M-21	J. C. Landers...	.....	D	98.3	6	IPpv	990	76.7	12- 7-59	M	D	62	11	18	
M-22	H. E. Wren.....	.....	D	66.6	6	IPpv	1,001	57.3	4-20-60	Tj	D	....	11	26	Cased to 6 ft.
M-23	.....	.....	D	78.7	6	IPpv	950	65.9	4-20-60	N	N	....	...	...	
M-24	S. Adams.....	Godsley Drilling Co.	D	72.7	6	IPpv	990	56.2	12- 7-59	M	D	62	4	50	Cased to 18 ft.
M-25	.....do.....	.....do.....	D	59.9	6	IPpv	975	44.9	12- 7-59	M	D	....	...	...	Cased to 30 ft. Alum taste reported.
M-26	C. E. Pace.....	Strickland Drilling Co.	D	172.0	6	IPpv	1,002	91.0	12-10-59	Pv	D,S	....	11	20	Supplies 1 family and 6,000 chickens.
M-27	J. T. Stanford...	Kent Drilling Co.	D	150.0	6	IPpv	945	117.5	12- 9-59	Tj	D	....	11	20	
M-28	V. Stanford.....	.....	Du	23.7	40	R	942	17.4	12- 9-59	M	D	....	...	...	
M-29	I. Oliver.....	Godsley Drilling Co.	D	164.9	6	IPpv	1 005	105.1	12-11-59	Tj	D	....	...	...	
M-30	E. Leroy.....	.....	Du	20.1	40	R	942	17.2	12-10-59	M	D	....	...	...	Supply inadequate during dry season.
M-31	W. M. Portor....	Baird Drilling Co.	D	185	6	IPpv	963	145	11- -59	Tj	D,S	....	...	...	Cased to 40 ft. Supplies 1 family and 18,000 chickens.
M-32	B. Yokum.....	.....	D	.....	6	IPpv	945	87.0	12-10-59	Tj	D,S	....	...	...	Supplies 1 family and 30,000 chickens.
M-33	W. T. Fennel...	.....	Du	45.2	40	R	1,010	39.5	12-10-59	Tj	D,S	....	11	80	Supplies 1 family and 10,000 chickens.
M-34	T. Owens.....	.....	Du	32.1	40	R	925	30.6	12- 9-59	Tj	D	....	11	75	Supply inadequate during dry season.

M-35	S. A. Pugh.	Baird Drilling Co.	D	100	6	IPpv	885	50	11- -59	Tj	D,S	....	...	...	Cased to 80 ft. Supplies 1 family and 9,000 chickens; copper and iron taste reported. Iron precipitate in water.
M-36	J. W. Rice.....	.....	Du	21.1	40	R	1,020	18.6	12- 9-59	M	D	....	...	...	Supply inadequate during dry season.
M-37	A. H. Southern..	Strickland Drilling Co.	D	416	6	IPpv	1,020	52.5	12- 9-59	Tj	D,P S	....	...	...	Supplies 2 families, 12,000 chickens and a gasoline station-store.
M-38	A. W. Creel.....	.....	D	41.1	6	IPpv	835	36.7	12- 9-59	M	D	64	11	15	No casing; bedrock at 6 ft. Supply inadequate during dry season.
M-39	R. Oden.....	.....	D	.....	6	IPpv	850	57.6	12- 9-59	Tj	D	....	...	...	Supplies 2 families.
M-40	J. P. Richardson	Strickland Drilling Co.	D	160	6	IPpv	945	147.0	12- 9-59	Tj	D	....	11	20	Cased to 30 ft.
M-41	P. Spears.....	.....	Du	24.2	40	R	942	21.1	12- 9-59	N	N	....	...	...	
M-42	.....do.....	.....	Du	41.2	40	R	1,008	17.4	12- 9-59	M	D	....	...	...	
M-43	W. Spradling....	.....	D	61.7	6	IPpv	980	53.8	4-25-60	N	N	....	...	...	
M-44	J. B. Turner....	.....	Du	25.0	40	R	917	21.7	12- 9-59	M	D	63	18	30	Supply inadequate during dry season.
M-45	T. Arnold.....	.....	Du	22.8	40	R	942	17.4	12- 9-59	M	D	....	...	...	Do.
M-46	P. H. Harris....	.....	Du	21.3	40	R	920	21.1	12- 9-59	M	D	....	...	...	Do.
M-47	P. McGuire.....	Jackson Drilling Co.	D	180.0	6	IPpv	930	128.9	12- 9-59	Tj	D,S	....	11	60	Supplies 1 family, 11 cows, and 6,000 chickens; muddy after rain.
M-48	H. F. Southern..	.....	Du	30.4	40	R	940	23.9	12-15-59	Tj	D	....	11	20	
M-49	C. D. Rogers...	.....	D	41.7	6	IPpv	965	36.0	12-15-59	N	N	....	...	...	
M-50	W. C. Burson...	.....	Du	23.0	40	R	1,025	15.5	12-15-59	Tj	D	....	...	...	Supply inadequate during dry season.
N- 1	A. C. Weeks....	.....	Du	23.8	40	R	1,000	21.0	12- 7-59	Tj	D,S	....	...	...	Supplies 1 family and 12,000 chickens.
N- 2	W. H. Weeks....	.....	Sp	.....	...	IPpv	940	.....	.....	Tj	D,S	62	11	65	Supplies 1 family and 18,000 chickens. Measured flow 22 gpm on 12-7-59.
N- 3	J. F. Crockett..	.....	Du	22.8	36	R	965	17.2	12- 7-59	M	D	....	...	...	Supply inadequate during dry season.
N- 4	G. O'Kelly.....	.....	Du	12.4	36	Kt	1,042	10.9	10-28-59	M	D	....	...	...	Do.
N- 5	B. F. McColur..	.....	Du	24.9	40	Kt	1,060	20.8	10-28-59	M	D	62.5	46	45	

Table 5.—*Records of wells and springs in Franklin County*—Continued

Well or spring no.	Owner	Driller	Type	Depth of well (feet)	Diameter of well (inches)	Water-bearing unit	Altitude of land surface (feet)	Water level		Method of lift	Use of water	Field determinations			Remarks
								Above (+) or below land surface (feet)	Date of measurement			Temperature (°F)	Chloride (Cl) (ppm)	Hardness as $CaCO_3$ (ppm)	
N- 6	J. H. Stegall....	.....	Du	20.3	40	Kt	1,058	14.9	10-28-59	Tj	D	....	39	45	
N- 7	J. Mitchell.....	.....	Du	31.1	36	Kt	1,042	27.8	10-28-59	Tj	D	....	...	...	Supply inadequate during dry season.
N- 8	N. Bird.....	.....	Du	24.5	40	Kt	1,036	19.7	10-27-59	M	D	63.5	40	25	
N- 9	Z. Winsted.....	.....	Du	21.9	40	Kt	1,040	21.6	10-28-59	M	D	....	...	...	Supply inadequate during dry season; muddy after rain.
N-10	J. Hutchenson...	.....	Du	36.0	40	Kt	1,045	32.2	10-28-59	Tj	D	....	...	...	Supply inadequate during dry season.
N-11	G. F. Taylor....	.....	Du	27.2	40	Kt	1,042	24.3	10-27-59	Tj	D	....	...	...	Do.
N-12	C. Carpenter....	.....	Du	39.9	40	Kt	1,062	36.7	10-27-59	Tj	D,S	....	11	25	Supplies 1 family, 25 hogs, and 6,000 chickens.
N-13	G. Cofield.....	.....	Du	36.5	36	Kt	1,050	33.2	10-27-59	M	D	....	...	...	Supply inadequate during dry season; muddy after rain.
N-14	Franklin County, Spruce Pine School.	.....	Du	29.8	36	Kt	1,043	26.7	10-27-59	Tj	P	....	11	15	Cased to 30 ft. Supplies lunchroom and bathrooms for 65 students.
N-15	H. G. Rauschenburg.	H. W. Peerson Drilling Supply Co.	D	128	6	IPpv, Kt (?)	1,023	32.8	10-27-59	Tj	D	....	11	20	Cased to 20 ft. Iron taste, odor, and color; iron precipitate in sample; clear stream at 65 ft.; iron-bearing stream at 110 ft.; iron filter connected onto water system.
N-16	H. Moses.....	.....	Du	14.8	36	Kt	1,010	12.0	10-26-59	M	D	67	...	...	

N-17	L. Smith.....	.....	D	24.0	6	Kt	1,010	15.9	10-27-59	Tj	D	....	11	30	Supplies 2 families. Used as observation well (fig. 5).
N-18	A. AgDedarman.	.....	D	60	6	IPpv, Kt (?)	1,020	25.8	10-27-59	Tj	D,S	....	..	...	Cased to 20 ft. Supplies 1 family and 40 cows.
N-19	J. Scharnagel...	.....	Du	32.8	40	Kt	1,010	24.5	10-26-59	Tj	D	....	25	70	Water level low only once since 1914.
N-20	C. Strickland...	.....	Du	24.9	40	Kt	990	22.6	10-27-59	M	N	64	11	165	
N-21	B. I. Holmes...	.....	Du	25.3	36	R	955	15.3	4-19-60	Tj	D	....	...	...	
N-22	P. Strickland...	.....	Du	28.0	36	Kt	1,015	24.6	10-27-59	Tj	D	....	...	...	Supply inadequate during summer and fall of 1954.
N-23	E. W. Sumeral..	.....	Du	16.8	36	R	950	11.8	4-20-60	M	D	60	54	105	Cased to 17 ft.
N-24	G. Bates.....	.....	Du	.....	36	Kt	1,045	6.7	4-19-60	Tj	D,S	....	...	...	Supplies 1 family, 25 hogs, and Grade A dairy barn.
N-25	V. Warhurst.....	.....	Du	38.9	36	R	965	27.0	4-20-60	Tj	D,S	....	32	110	Supplies 1 family, 100 hogs, and 6,000 chickens.
N-26	C. Taylor.....	O. V. Taylor Drilling Co.	D	162.0	6	IPpv	970	61.2	4-25-60	Tj	D	....	...	...	Cased to 63 ft.; bedrock at 6 ft.
N-27	M. Henry.....	.....	Du	44.7	40	R	942	34.5	4-19-60	M	D	....	...	...	Supply inadequate during dry season.
N-28	H. Welborn.....	Cotton Drilling Co.	D	56.0	6	IPpv	945	12.8	4-20-60	Tj	D,S	....	46	45	Supplies 1 family, 30 hogs, and 19 cows; asphaltic taste reported.
N-29	D. Hyde.....	.....	Du	15.3	36	Kt	1,020	8.1	4-20-60	N	N	....	...	...	
N-30	T. F. Murray....	.....	Du	26.3	36	Kt	1,002	15.7	4-19-60	M	D	55	32	65	Used only for drinking water; city water used for other domestic needs.
*N-31	Town of Phil Campbell.	H. W. Peerson Drilling Supply Co.	D	350	8	IPpv	1,010	162	5- 7-52	T	P	62.5	4	30	Cased to 100 ft. Supplies town of Phil Campbell (350 families and 550 students); reported pumped 60,000 to 120,000 gpd.
N-32	B. I. Holmes....	.....	D	56	6	IPpv	885	38.0	4-19-60	M	N	....	...	...	Copper taste reported. Obstruction in well at 40 ft.
N-33	J. Stewart.....	.....	Du	28.8	36	Kt	980	23.5	4-20-60	Tj	D	....	81	110	
N-34	S. C. Wright.....	.....	Du	15.6	36	Kt	1,002	11.4	4-20-60	N	N	....	...	...	

Table 5.—*Records of wells and springs in Franklin County*—Continued

Well or spring no.	Owner	Driller	Type	Depth of well (feet)	Diameter of well (inches)	Water-bearing unit	Altitude of land surface (feet)	Water level		Method of lift	Use of water	Field determinations			Remarks
								Above (+) or below land surface (feet)	Date of measurement			Temperature (°F)	Chloride (Cl) (ppm)	Hardness as $CaCO_3$ (ppm)	
*N-35	Town of Phil Campbell.	H. W. Peerson Drilling Supply Co.	D	315	8	IPpv	1,025	185.0	6- 9-60	N	N	....	...	...	Cased to 92.5 ft. Used as Phil Campbell's water supply from 1941 to 1953; streams at 190 ft. (5-10 gpm) 210 ft. (5 gpm), and 280-290 ft. (40-50 gpm); pumped 56-62 gpm in March 1941 for 18 hours with drawdown of 20 ft.; recovered in 2 minutes; pumped 41 gpm on 4-8-53 for 8 hours with drawdown unknown; recovered 15 to 20 ft. in 1 hour.
N-36	E. Rice.....	.....	Du	26.7	36	R	970	14.2	4- 2-60	N	N	....	...	...	
N-37	C. B. Messer....	Hasley Drilling Co.	D	186.5	6	IPpv	944	161.5	4-25-60	Tj	D	....	87	55	Cased to 96 ft.; bedrock at 30 ft.; stream at 177 ft.
N-38	C. B. Messer, Jr.	.....	Du	32.5	36	R	941	14.6	4-25-60	Tj	D	....	81	40	
N-39	M. Fuller.....	.....	D	69.4	6	IPpv	824	43.4	4-25-60	M	N	62	25	50	Bedrock crops out at surface.
N-40	T. L. Hale.....	.....	Du	37.0	36	R	925	27.6	4-25-60	Tj	D	....	...	...	Well can be pumped dry by a ½-hp pump.
N-41	A. A. Smith.....	.....	Du	24.6	36	R	965	15.5	4-27-60	M	D	57	138	185	
N-42	W. E. Cox.....	Baird Drilling Co.	D	195	6	IPpv	995	.....	.....	Pv	D	....	18	30	Cased to 120 ft.; bedrock at 60 ft. Iron content in water necessitates filter on system.
N-43	M. M. Godsley...	.....	Du	13.4	36	Kt	1,003	6.5	4-20-60	Tj	D	54	60	90	Supply inadequate during dry season; lime taste reported.

N-44	A. Burrow.....	Baird Drilling Co.	D	257	6	IPpv	950	187.0	4-20-60	Ts	D,S	....	39	40	Cased to 155 ft. Supplies 1 family and 50 hogs.
N-45	H. Prince.....	.....	Du	22.9	40	R	925	11.9	4-20-60	M	D	55	66	100	
N-46	C. L. Phillips...	.....	Du	19.0	36	R	902	8.6	4-27-60	Tj	N	....	...	...	Supply inadequate during dry season.
*N-47	C. H. Pounders..	Smith Drilling Co.	D	178	6	IPpv	915	124.3	4-27-60	Tj	D,S	....	...	...	Supplies 1 family and 3,000 chickens; iron taste reported.
*N-48	A. Vickery.....	Baird Drilling Co.	D	.....	6	IPpv	925	.....	.....	Tj	D,P	62	...	...	Supplies 1 family and restaurant; iron content in water necessitates a filter on system.
N-49	M. G. Kelley....	.....	Du	24.3	36	R	905	14.5	4-27-60	M	D	56.5	130	60	Supply inadequate during dry season.
N-50	W. H. Wright....	.....	Du	29.7	36	R	964	12.9	4-25-60	Tj	D	....	...	...	
O- 1	H. Strickland....	.....	Du	24.0	36	Kt	1,022	20.7	10-26-59	Tj	D	....	...	...	Cased to 24 ft. Supply inadequate during dry season.
O- 2	W. E. Taff.....	Kent Drilling Co.	D	45.5	6	Kt	1,022	16.6	10-26-59	Tj	S	....	11	15	Supplies 28 cows and a Grade B dairy barn; can be pumped dry by a ¾-hp pump.
O- 3	R. Wallace.....	.....	Du	22.0	45	Kt	975	11.8	10-26-59	Tj	D	....	...	...	
O- 4	C. Stancel.....	.....	Du	23.0	36	Kt	1,000	19.5	10- 1-59	Tj	D	....	...	...	Supply inadequate three times since 1910.
O- 5	.....do.....	Harris Drilling Co.	D	75.2	6	IPpv	950	25.5	10- 1-59	M	D	63	18	20	Cased to 3 ft. Stream at 75 ft.
O- 6	R. McDoogle....	.....	D	76.6	6	IPpv, Kt (?)	965	34.2	10- 2-59	M	D	62	11	30	Cased to 20 ft. Iron taste reported.
O- 7	L. T. McDought..	Thomas Drilling Co.	D	50.7	6	IPpv, Kt (?)	985	18.2	10- 2-59	N	N	....	...	...	Cased to 10 ft. Iron taste reported.
O- 8	.....do.....	.....do.....	D	60	6	IPpv, Kt (?)	965	15	9- -59	Tj	D	....	...	...	Cased to 6 ft. Iron taste reported; can be pumped dry by a ½-hp pump.
O- 9	M. Pounders....	Roberts Drilling Co.	D	34.4	6	Kt	980	23.0	10- 2-59	M	D	64	39	95	Cased to 22 ft.

Table 5.—*Records of wells and springs in Franklin County*—Continued

Well or spring no.	Owner	Driller	Type	Depth of well (feet)	Diameter of well (inches)	Water-bearing unit	Altitude of land surface (feet)	Water level		Method of lift	Use of water	Field determinations			Remarks
								Above (+) or below land surface (feet)	Date of measurement			Temperature (°F)	Chloride (Cl) (ppm)	Hardness as $CaCO_3$ (ppm)	
O-10	A. B. Grisson...	Kent Drilling Co.	D	93	6	IPpv	945	39.2	10-19-59	Tj	D,S	....	11	40	Cased to 17 ft. Supplies 1 family and Grade B dairy barn; can be pumped dry by a ½-hp pump.
O-11	T. O. Scott	.....	Du	43.1	36	Kt	925	38.1	10-21-59	M	D	62.5	25	105	Supply inadequate during dry season.
O-12	E. J. James.....	.....	Du	25.8	36	Kt	905	23.8	10-21-59	M	D	64.5	32	145	Do.
O-13	R. N. Hamilton..	.....	Du	15.0	36	R	901	12.6	10-21-59	Tj	D	....	...	...	Do.
O-14	G. Strickland....	.....	Du	49.4	40	Kt	930	35.6	5-11-60	M	D	59	46	40	
O-15	W. Taylor.....	.....	D	24.9	6	R	884	11.0	4-29-60	Tj	D	....	25	30	
O-16	L. A. Albston...	.....	Du	50	36	Kt	975	31.0	4-29-60	Tj	D	....	...	...	Do.
O-17	T. Pounders....	.....	Du	47.0	36	Kt	947	36.8	5-11-60	M	D	60	25	100	
O-18	D. Fleming.....	.....	Du	22.8	60	Kt	935	11.4	5-11-60	M	D	55	68	70	Do.
O-19	B. Cheatam.....	.....	Du	31.9	40	Kt	940	23.3	5-11-60	M	D	57.5	89	45	Muddy after rain.
O-20	G. Duke.....	.....	Du	18.5	40	Kt	921	10.5	5-17-60	M	D	64	18	55	Supplied cotton gin and sawmill boilers at one time.
O-21	W. Cheeks.....	.....	Du	37.3	40	Kt	940	34.5	5-18-60	M	D	58	4	60	Supply inadequate during dry season.
O-22	H. Cleavland....	.....	Du	29.8	40	Kt	885	13.8	5-12-60	M	D	57	11	50	
O-23	L. Rapper.....	.....	Du	22.7	36	Kt	901	12.7	5-11-60	M	D	62.5	25	25	
O-24	J. R. Cockran...	.....	Du	31.7	40	Kt	942	21.8	5-11-60	M	D	59	46	120	Supply inadequate during fall of 1954.
O-25	H. Wilburn.....	.....	Du	28.2	40	Kt	930	16.8	5-11-60	M	D	58	60	25	Supply inadequate during dry season; muddy after rain.
O-26	R. Herring.....	.....	Du	28.3	40	Kt	960	16.2	5-12-60	Tj	D	....	53	90	
O-27	J. W. Nix.....	.....	Du	37.4	60	Kt	975	27.8	5-11-60	M	D	58	11	45	Supplied cotton gin boiler at one time.

O-28	L. Nix.....	.....	Du	23.2	40	Kt	965	13.8	4-29-60	M	D	....	39	45	
O-29	J. B. Herring....	.....	Du	28.6	36	Kt	965	10.8	4-29-60	Tj	D	....	18	35	
O-30	O. D. Clark.....	.....	Du	19.3	36	R	940	13.2	5- 9-60	M	D	55.5	25	45	Supply inadequate during dry season.
O-31	D. A. Freeman..	.....	Du	26.4	40	Kt	960	15.9	5- 9-60	Tj	D	....	24	30	Curbed to 26 ft. Supply inadequate during dry season.
O-32	L. B. Keplinger.	.....	Du	18.9	36	Kt	955	14.3	5- 9-60	M	D	....	...	...	Supply inadequate during dry season.
O-33	M. R. Cooper....	.....	Du	50.5	40	Kt	942	40.5	5- 9-60	Tj	D	....	...	...	
O-34	N. Adams.....	.....	Du	34.4	40	Kt	930	28.9	5- 9-60	N	N	....	...	...	
O-35	M. Rapper.....	Peoples Drilling Co.	D	41.6	6	Kt	900	24.2	5-11-60	Tj	D	....	18	90	Cased to 22 ft. Supply inadequate during dry season.
O-36	W. Clark.....	.....	Du	27.9	40	Kt	895	15.8	5-11-60	M	D	58	18	90	
*O-37	E. Cook.....	.....	Du	25.5	40	Kt	890	11.5	5-11-60	Tj	N	63	230	135	Slick to oily taste reported.
O-38	J. T. Adams....	.....	Du	30.2	40	Kt	902	18.1	5- 9-60	M	D	58	39	95	
O-39	B. Wade.....	.....	Du	24.7	40	Kt	922	11.8	5- 9-60	Tj	D	....	...	...	Cased to 25 ft. Supply inadequate during dry season.
O-40	W. Mays.....	.....	Du	38.3	40	Kt	970	24.9	4-20-60	Tj	D	....	...	...	
P- 1	A. J. Scott.....	.....	Du	18.6	36	Kt	875	14.3	10-16-59	Tj	D	....	18	180	Supply inadequate during dry season.
P- 2	L. Oliver.....	.....	Du	29.0	40	Kt	885	19.4	10-16-59	N	N	....	...	...	
P- 3	.....do.....	.....	Du	25.5	36	Kt	902	21.8	10-16-59	M	D	64	18	80	
P- 4	M. L. Lawler....	.....	Du	26.3	40	R	905	19.2	5-18-60	N	N	....	...	...	
P- 5	J. Avery.....	.....	D	117.3	6	IPpv	820	112.0	6-27-60	N	N	....	...	...	
P- 6	W. O. Wilson....	.....	D	132.0	6	IPpv	820	107.5	6-28-60	M	D	62	4	90	Supplies 10 people.
P- 7	Scott Brothers...	.....	D	.....	6	IPpv	802	59.0	6-27-60	Tj	S	....	...	...	Supplies 400 hogs.
P- 8	A. V. Scott.....	.....	D	98.7	6	Mb, IPpv (?)	620	38.9	6-27-60	N	N	....	...	...	Cased to 50 ft.
P- 9	R. C. Scott.....	.....	D	44.4	6	IPpv	864	29.8	5-18-60	M	D	59	11	40	Bedrock crops out at surface.
P-10	A. R. Scott.....	.....	D	61.2	6	IPpv	877	39.7	5-18-60	M	D	60.5	21	80	Cased to 6 ft.
P-11	R. Williams.....	.....	D	31.9	6	IPpv	860	18.6	5-11-60	Tj	D	....	...	...	Supplies 2 families; supply inadequate during dry season.
P-12	E. Cochran.....	.....	Du	24.4	36	Kt	825	16.3	6-22-60	M	D	58.5	32	60	
P-13	Franklin County, Hodges School.	.....	D	85.0	6	IPpv	846	65.5	6-22-60	Tj	P	....	...	...	Supplies lunchroom and bathrooms for 96 students, and boiler for steam heating system.

Table 5.—*Records of wells and springs in Franklin County*—Continued

Well or spring no.	Owner	Driller	Type	Depth of well (feet)	Diameter of well (inches)	Water-bearing unit	Altitude of land surface (feet)	Water level		Method of lift	Use of water	Field determinations			Remarks
								Above (+) or below land surface (feet)	Date of measurement			Temperature (°F)	Chloride (Cl) (ppm)	Hardness as $CaCO_3$ (ppm)	
*P-14	Town of Hodges.	.....	D	134.0	8	IPpv	845	38.7	6-22-60	T	P,S	....	18	30	Cased to 60 ft. Supplies 18 business establishments including 1 cafe and 2 service stations, 11,000 chickens, 100 cows, and 100 hogs.
P-15	Scott Brothers...	.....	D	72.8	6	IPpv	795	4.9	6-27-60	Tj	S	....	...	...	Supplies 100 cows and 250 hogs.
P-16	W. Fleming.....	.....	Du	32.5	36	Kt	842	30.5	6-22-60	M	D	60	4	45	Supply inadequate during dry season.
Q- 1	R. Isbell.....	.....	Du	19.7	36	Kt	745	17.1	8-11-60	M	D	....	...	...	Do.
*Q- 2	Franklin County, Vina School.	.....	Sp	.....	...	Kt	660	.....	.....	T	P Ind	60.5	11	20	Davis Spring. Supplies 500 students; used to water lawns and football field.
Q- 3	Town of Vina...	H. W. Peerson Drilling Supply Co.	D	900	10-8	.....	690	65-75	5- -47	...	...	....	...	...	Well abandoned and filled. Reported yield 10 gpm.
Q- 4	H. Ballwin.....	.....	Du	74.4	40	Kt	785	78.5	6-29-60	M	D	60	4	65	Bluish color.
Q- 5	R. Shambley....	.....	D	60.9	6	IPpv	802	44.9	7- 6-60	M	D	....	...	...	Bedrock at 45 ft. Supply inadequate during dry season.
Q- 6	Belcher Estate..	.....	Du	58.0	36	Kt	765	53.7	6-29-60	Tj	D	....	...	...	
Q- 7	E. L. Hooker....	.....	Du	29.5	36	Kt	715	13.4	7- 6-60	M	D	57.5	11	70	Cased to 30 ft.
Q- 8	L. Osburn.....	.....	Du	28.1	36	Kt	710	24.8	7- 6-60	M	D	60	11	25	
Q- 9	L. N. Mathis....	.....	Du	23.6	36	Kt	700	20.6	6-30-60	M	D	61.5	18	60	Iron taste reported.
Q-10	M. R. Vondrell..	.....	Du	23.7	36	Kt	740	17.9	7- 6-60	Tj	D	....	46	35	
Q-11	J. O. Childers...	.....	Du	20.1	36	Kt	755	17.8	6-29-60	M	D	60	11	40	Supply inadequate during dry season.

Q-12	F. Overton.....	.....	Du	34.0	48	Kt	865	30.3	6-28-60	Tj	D	....	...	...	Cased to 34 ft. Supply inadequate during dry season.
Q-13	S. A. Hobson Co.	.....	D	2,609	....	....	569	.....	.....	...	....	....	...	...	Oil test well; abandoned and filled (Bowles, 1941, p. 20-22).
Q-14	E. A. Childers..	.....	Du	27.5	48	Kt	722	21.3	6-29-60	N	N	....	...	...	Muddy after rain.
Q-15	H. A. Renfro....	.....	Du	15.3	40	Kt	710	10.8	7- 6-60	Tj	D	....	39	10	Can be pumped dry by a ½-hp. pump.
Q-16	F. Childers.....	.....	Du	55.6	36	Kt	670	49.3	6-30-60	M	D	62	11	20	Supplies 12 people.
Q-17	H. Stitter.....	.....	Du	36.7	36	Kt	705	34.3	6-30-60	M	D	....	...	...	Supply inadequate during dry season.
R- 1	S. G. Berry.....	.....	Du	51.6	36	Kt	745	46.5	8-11-60	M	D	62.5	18	30	Supplies 10 people.
R- 2	O. Sparks.....	.....	Du	30.9	36	Kt	760	26.5	8-11-60	M	D	....	...	...	
R- 3	N. Massey.....	H. W. Peerson Drilling Supply Co.	D	55.2	8	Kt	645	15.6	6-30-60	N	N	....	...	..	Oil test well. Reported depth 282 ft.
R- 4	J. Shotts.....	.....	Du	20.0	36	Kt	645	12.7	6-30-60	M	N	64	4	50	
R- 5	L. Humphres....	.....	Sp	.....	...	Kt	540	.....	.....	N	N	61.5	4	20	Good Spring. Estimated flow 30-40 gpm on 7-7-60.
R- 6	C. Humphres....	.....	Du	15.2	36	Kt	610	7.5	7- 7-60	M	D	63	11	20	Supply inadequate during dry season.